

Taps and Dies

**Carbon Steel
High-Speed Steel**



Winter Brothers Company
Wrentham, Mass.
U. S. A.

Winter Brothers Co. 208
Wrentham, Mass.

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Winter Brothers Company

Wrentham, Mass.

Carbon Steel Taps and Dies

High-Speed Steel Taps and Dies



Thistle Brand

Catalogue No. 8

This catalogue cancels all previous editions



Factory of Winter Brothers Company, Wrentham, Massachusetts, U. S. A.



Catalogue No. 8

(High-Speed Steel Tap and Die lists in colored section)

ALL goods listed in this catalogue are fully warranted, and we will replace any tool showing imperfections either in material or workmanship.

When specifications differ in any way from our lists, the goods referred to will be classed as special, and will be charged for at special prices, the prices depending upon the quantity ordered at one time.

When ordering, or making inquiry for special goods, give complete specifications, submitting a sketch or a sample when possible.

When ordering either taps or dies to fit a sample, always send a male gauge if possible.

When shipping instructions are not given, we will ship in accordance with our judgment, which must be accepted by the customer.

Goods sent by mail at the purchaser's risk.

We ship no goods C. O. D.

All shipments are made F. O. B. Wrentham.

All orders filled with United States Standard threads, unless we are otherwise instructed.

Please read carefully all notes and instructions.



Size of Taps

The best way to make threaded work interchangeable is to use standard size plug thread gauges for testing all tapped holes. The thread gauge should represent the maximum screw size, so it is evident that taps must be a little over standard size, to allow for an easy fit, and a little for wear.

There is quite a difference in opinion as to what constitutes a good fit. Our regular practice on hand taps for U. S. S. screws is as follows: All sizes up to $\frac{1}{16}$ " diameter, inclusive, have pitch diameters .001 to .002" over standard; $\frac{1}{8}$ " to $\frac{1}{4}$ " diameter, inclusive, .0015 to .003" over standard; $\frac{1}{2}$ " to 2" diameter, inclusive, .002 to .004" over standard; 2" to 3" diameter, .003 to .005" over standard; and on all sizes the outside diameter about 50% more over standard size than the pitch diameter. Tapper taps for nuts are generally demanded fully as large as the above. Our V thread taps are also made over the standard diameters.

Remember that the outside diameter of a tap has nothing to do with the fit, as long as it is large enough. An increase over standard diameter simply gives clearance above the screw threads, which is desirable, and at the same time allows for the wear of the taps, which is much greater on top of the thread than on the angular sides. Bear these facts in mind when ordering special taps, especially those of decimal dimensions, and those having V threads (see page 7), because if you give the outside diameter only we are liable to make a poor guess at what you actually need.

The pitch diameter is the vital dimension. All users and makers of threaded work should be supplied with thread calipers.



Lead

The "lead"—a term which, when applied to tap or screw threads, means the distance advanced in one complete revolution—has much to do with the fit. When the threads are of considerable length the effect of incorrect lead is serious, often causing more trouble than variations in the pitch diameter, while it also happens that it is much more difficult to keep either taps or screws to close limits in lead than in pitch diameter.

In taps, variation in hardening changes is the chief cause of lead troubles. Manufacturers of high grade taps use great care in making allowances for changes in length, as different brands of steel vary greatly, and different sizes do not change the same amounts. Fine threads do not change the same as coarse threads of the same diameter. Variations in the number and form of the flutes also affect the results.

It requires great care, and very uniform steel, to keep the lead of taps within .002" variation from standard in one inch long, but commercial screws often vary as much as .010" in one inch.

With dies the chances for lead troubles are greater than with taps, as we have the hardening of both hobs and dies to contend with, and in use the lead cut by dies is varied by conditions. Holders that do not run true, extreme changes in adjustment, undue pressure advancing or retarding the lead, etc., often cause trouble for which the die manufacturer is not responsible.



Speed of Operation

It is not often possible for us to give customers definite figures for the speed at which they should operate taps and dies, because there are too many conditions over which we have no control. The material operated on, the machines used, the quantity and quality of the lubrication supplied, all have an important influence on the results. When comparing the speed of taps or dies with other metal cutting tools, bear in mind that they are operated with a positive feed equal to their lead, which is much faster than the feed of most other tools; therefore their speed must usually average lower, unless the work is distributed over a long taper, so that the chip taken by each thread is light. Coarse thread taps or dies not only cut out more stock than fine threads, but, if operated at the same speed, must do the extra work in shorter time, so the diameter alone must not be used as an index for the speed.

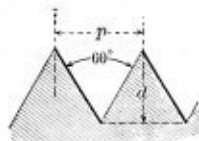
Lubrication

Taps and dies should always be well lubricated. This grows more important as the speed increases. There are numerous cheap cutting mixtures and oils on the market that may answer well enough for some classes of work, where cooling is often more important than lubrication; but for taps and dies, especially if threading steel, we recommend cotton-seed, lard or sperm oils only, for good work. Some of our best results under the most severe tests have been with cotton-seed oil, but it is inclined to "gum" up the machines.

Form of Cutting Edges

This is another important item when seeking maximum results. It is evident that we must make our stock work so that it will average well for the materials most commonly used. By far the greatest number of dies are used on steel, so they are regularly made with a "hooking cut." Taps are used in almost every class of material, so we regularly make them with cutting edges nearly radial, but hooking slightly. We can often help our customers very much on this question if we know all the conditions. We carry three styles of machine screw taps in stock.

V Standard Thread



Formula $\left\{ \begin{array}{l} P = \text{pitch} = \frac{1}{\text{No. threads per inch}} \\ D = \text{depth} = P \times .86603 \end{array} \right.$

Do not be deceived by the above formula. It is not possible to form, by ordinary means, 60 degree threads of the theoretical depth. If a thread is cut to theoretical pitch diameter the outside diameter will be reduced about .002° under standard, and will be so sharp as to be impracticable. On this account our standard V thread taps and dies are all made with their angular measurement, or pitch diameter, considerably larger than the theoretical size. All other tap makers follow the same principle, but no two make the same allowance on all sizes. Therefore: THERE IS NO RECOGNIZED STANDARD FOR V THREAD TAPS.

Standard Pitches

Diameter. No. Threads.	$\frac{1}{4}$ 20	$\frac{5}{16}$ 18	$\frac{3}{8}$ 16	$\frac{7}{16}$ 14	$\frac{1}{2}$ 12	$\frac{9}{16}$ 12	$\frac{5}{8}$ 11	$\frac{3}{4}$ 11
Diameter. No. Threads.	$\frac{3}{4}$ 10	$\frac{5}{8}$ 10	$\frac{7}{8}$ 9	$\frac{5}{8}$ 9	1 8	$1\frac{1}{8}$ 7	$1\frac{1}{4}$ 7	$1\frac{3}{8}$ 6
Diameter. No. Threads.	$1\frac{1}{2}$ 6	$1\frac{5}{8}$ 5	$1\frac{3}{4}$ 5	$1\frac{7}{8}$ $4\frac{1}{2}$	2 $4\frac{1}{2}$	$2\frac{1}{8}$ $4\frac{1}{2}$	$2\frac{1}{4}$ $4\frac{1}{2}$	$2\frac{3}{8}$ $4\frac{1}{2}$
Diameter. No. Threads.	$2\frac{1}{2}$ 4	$2\frac{3}{8}$ 4	$2\frac{3}{4}$ 4	$2\frac{7}{8}$ 4	3 $3\frac{1}{2}$	$3\frac{1}{8}$ $3\frac{1}{2}$	$3\frac{1}{4}$ $3\frac{1}{2}$	$3\frac{3}{8}$ $3\frac{1}{4}$
Diameter. No. Threads.	$3\frac{1}{2}$ $3\frac{1}{4}$	$3\frac{3}{4}$ $3\frac{1}{4}$	$3\frac{3}{4}$ 3	$3\frac{1}{2}$ 3	4 3			

We recommend the use of the U. S. S. form of thread only, and will furnish it on all orders unless otherwise instructed. We have already eliminated from our lists many V thread sizes formerly furnished, and expect in time to leave them out entirely.



United States Standard Thread



Formula

$$\begin{cases} P = \text{pitch} = \frac{1}{\text{No. threads per inch}} \\ D = \text{depth} = P \times .64952 \\ F = \text{flat} = \frac{P}{8} \end{cases}$$

Unlike the sharp V thread, the U. S. S. form can readily be cut to the figures resulting from the use of the formula.

Taps are not generally made exactly standard size, but slightly larger, so that standard plug thread gauges will easily screw into the tapped holes, and also to allow a little for wear. (See page 4.)

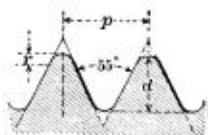
Standard Pitches

Diameter. No. Threads	$\frac{1}{4}$ 20	$\frac{5}{16}$ 18	$\frac{3}{8}$ 16	$\frac{7}{16}$ 14	$\frac{1}{2}$ 13	$\frac{9}{16}$ 12	$\frac{5}{8}$ 11
Diameter. No. Threads	$\frac{3}{4}$ 10	$\frac{7}{8}$ 9	1 8	$1\frac{1}{8}$ 7	$1\frac{1}{4}$ 7	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6
Diameter. No. Threads	$1\frac{1}{8}$ $5\frac{1}{2}$	$1\frac{3}{4}$ 5	$1\frac{7}{8}$ 5	2 $4\frac{1}{2}$	$2\frac{1}{8}$ $4\frac{1}{2}$	$2\frac{1}{4}$ $4\frac{1}{2}$	$2\frac{3}{4}$ 4
Diameter. No. Threads	$2\frac{1}{2}$ 4	$2\frac{5}{8}$ 4	$2\frac{3}{4}$ 4	$2\frac{7}{8}$ $3\frac{1}{2}$	3 $3\frac{1}{2}$	$3\frac{1}{4}$ $3\frac{1}{2}$	$3\frac{1}{4}$ $3\frac{1}{2}$
Diameter. No. Threads	$3\frac{3}{8}$ $3\frac{1}{4}$	$3\frac{1}{2}$ $3\frac{1}{4}$	$3\frac{5}{8}$ $3\frac{1}{4}$	$3\frac{3}{4}$ 3	$3\frac{1}{2}$ 3	4 3	

While there is no United States Standard for $\frac{1}{16}$ " $\frac{1}{8}$ " and $\frac{3}{16}$ " diameters, you will find these sizes regularly listed with 11, 10 and 9 threads per inch respectively, throughout our catalogue. The U. S. S. thread will always be furnished, unless orders specify otherwise.



Whitworth Standard Thread

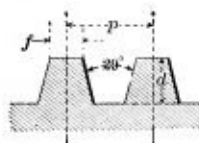


Formula

$$\begin{cases} P = \text{pitch} = \frac{1}{\text{No. threads per inch}} \\ D = \text{depth} = P \times .64033 \\ R = \text{radius} = P \times .1373 \end{cases}$$

Diameter	No. Threads per Inch	Diameter	No. Threads per Inch	Diameter	No. Threads per Inch	Diameter	No. Threads per Inch
$\frac{1}{4}$	20	$\frac{7}{8}$	9	$\frac{2}{3}$	$4\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{1}{4}$
$\frac{5}{16}$	18	$\frac{5}{8}$	9	$\frac{21}{32}$	$4\frac{1}{2}$	$3\frac{3}{8}$	$3\frac{1}{4}$
$\frac{3}{8}$	16	1	8	$2\frac{1}{4}$	4	$3\frac{1}{2}$	$3\frac{1}{4}$
$\frac{7}{16}$	14	$1\frac{1}{8}$	7	$2\frac{3}{8}$	4	$3\frac{5}{8}$	$3\frac{1}{4}$
$1\frac{1}{2}$	12	$1\frac{3}{4}$	7	$2\frac{1}{2}$	4	$3\frac{3}{4}$	3
$\frac{9}{16}$	12	$1\frac{3}{8}$	6	$2\frac{3}{4}$	4	$3\frac{7}{8}$	3
$\frac{5}{8}$	11	$1\frac{1}{2}$	6	$2\frac{1}{2}$	$3\frac{1}{2}$	4	3
$1\frac{1}{8}$	11	$1\frac{5}{8}$	5	$2\frac{1}{2}$	$3\frac{1}{2}$		
$\frac{3}{4}$	10	$1\frac{3}{4}$	5	3	$3\frac{1}{2}$		
$1\frac{1}{4}$	10	$1\frac{7}{8}$	$4\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{2}$		

Acme Standard Screw Thread



Formula

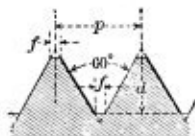
$$\begin{cases} P = \text{pitch} = \frac{1}{\text{No. threads per inch}} \\ D = \text{depth} = \frac{1}{2} P \times .0107 \\ F = \text{flat on top of thread} = P \times .3707 \end{cases}$$

It is the general practice to make the outside diameter of taps about .020" over the standard diameter of the screw, to cut a clearance above the screw threads.



International and French Standard Thread

(Metric System)



Formula

$$\begin{cases} P = \text{pitch} \\ D = \text{depth} = P \times 0.6495 \\ F = \text{flat} = \frac{P}{8} \end{cases}$$

International Standard

Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters
6	1.0	20	2.5	48	5.0
7	1.0	22	2.5	52	5.0
8	1.25	24	3.0	56	5.5
9	1.25	27	3.0	60	5.5
10	1.5	30	3.5	64	6.0
11	1.5	33	3.5	68	6.0
12	1.75	36	4.0	72	6.5
14	2.0	39	4.0	76	6.5
16	2.0	42	4.5	80	7.0
18	2.5	45	4.5		

French Standard

Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters	Diameter Millimeters	Pitch Millimeters
3	0.5	16	2.0	36	4.0
4	0.75	18	2.5	38	4.0
5	0.75	20	2.5	40	4.0
6	1.0	22	2.5	42	4.5
7	1.0	24	3.0	44	4.5
8	1.0	26	3.0	46	4.5
9	1.0	28	3.0	48	5.0
10	1.5	30	3.5	50	5.0
12	1.5	32	3.5		
14	2.0	34	3.5		



Machinists' Hand Taps

Less than $\frac{1}{4}$ " diameter



All orders will be filled with U. S. Form threads, unless otherwise specified.

All sizes, lengths and threads not listed are special, and subject to special prices.

Taps with Left-Hand threads are special.

Diameter	Number of Threads per Inch			Price Each	Per Set
	U. S. Form	V Form	Whitworth Standard		
$\frac{1}{16}$	64	64, 72	60	\$.35	\$1.05
$\frac{5}{64}$	56	56, 72		.35	1.05
$\frac{3}{32}$	48, 50	48, 56	48	.35	1.05
$\frac{7}{64}$	48	48, 56		.35	1.05
$\frac{1}{8}$	40, 48, 50	40, 48, 50	40	.35	1.05
$\frac{9}{64}$	32, 40	32, 40		.35	1.05
$\frac{5}{32}$	36, 40	32, 36, 40	32	.35	1.05
$\frac{3}{16}$	32	32		.35	1.05
$\frac{1}{4}$	24, 30, 32	24, 30, 32	24	.35	1.05
$\frac{5}{16}$	32	24, 32		.35	1.05
$\frac{3}{8}$	28, 32	24, 32	24	.35	1.05
$\frac{1}{2}$	24, 32	24, 32		.35	1.05



Machinists' Hand Taps



All orders will be filled with plug taps with United States Standard threads, unless otherwise specified.

All Hand taps up to and including $\frac{1}{2}$ " diameter have shanks the full size of thread. Taps $\frac{3}{8}$ " diameter and larger have shanks below the bottom of the thread.

S. A. E. (formerly A. L. A. M.) standard taps are included in this list, and also listed separately on page 56.

All sizes, lengths and threads not listed are special, and subject to special prices.

All Left-Hand taps are special.



Machinists' Hand Taps

Diameter	Total Length, Inches	Number of Threads per Inch					Price	
		Standard Number of Threads			Threads also Furnished		Each	Per Set
		U. S. S.	V	Whit.	U. S. Form	V Form		
$\frac{1}{4}$	2 $\frac{1}{2}$	20	20	20	24, 27, 28	24, 27, 32	\$.45	\$1.35
$\frac{1}{2}$	2 $\frac{1}{2}$	20	20				.45	1.35
$\frac{3}{8}$	2 $\frac{1}{2}$	20	20				.45	1.35
$\frac{5}{16}$	2 $\frac{3}{8}$	18	18	18	20, 24, 27	20, 24, 27, 32	.50	1.50
$\frac{3}{16}$	2 $\frac{3}{8}$	18	18				.50	1.50
$\frac{1}{8}$	2 $\frac{3}{8}$	18	18				.50	1.50
$\frac{3}{16}$	2 $\frac{1}{2}$	16	16	16	20, 24, 27	14, 18, 20, 24, 27	.55	1.65
$\frac{1}{2}$	2 $\frac{1}{2}$	16	16				.55	1.65
$\frac{1}{8}$	2 $\frac{1}{2}$	16	16				.55	1.65
$\frac{7}{16}$	3 $\frac{5}{8}$	14	14	14	20, 27	12, 16, 20, 24, 27	.60	1.80
$\frac{3}{8}$	3 $\frac{5}{8}$	14	14				.60	1.80
$\frac{1}{2}$	3 $\frac{5}{8}$	14	14				.60	1.80
$\frac{1}{2}$	3 $\frac{3}{8}$	13	12	12	12, 20, 27	13, 14, 16, 20, 24, 27	.70	2.10
$\frac{3}{8}$	3 $\frac{3}{8}$	13	12		12	13	.70	2.10
$\frac{1}{2}$	3 $\frac{3}{8}$	13	12		12	13	.70	2.10
$\frac{9}{16}$	3 $\frac{1}{2}$	12	12	12	18, 27	14, 27	.80	2.40
$\frac{3}{4}$	3 $\frac{1}{2}$	12	12				.80	2.40
$\frac{1}{2}$	3 $\frac{1}{2}$	12	12				.80	2.40
$\frac{5}{8}$	3 $\frac{1}{2}$	11	11	11	12, 18, 27	10, 12, 20, 24, 27	.90	2.70
$\frac{3}{4}$	3 $\frac{1}{2}$	11	11				.90	2.70
$\frac{7}{8}$	3 $\frac{1}{2}$	11	11				.90	2.70
$\frac{1}{2}$	4 $\frac{1}{2}$	11	11	11	12, 16	10, 12	1.05	3.15
$\frac{3}{4}$	4 $\frac{1}{2}$	11	11				1.05	3.15



Machinists' Hand Taps

(Continued)

Diameter	Total Length, Inches	Number of Threads per Inch					Price	
		Standard Number of Threads			Threads also Furnished		Each	Per Set
		U. S. S.	V	Whit.	U. S. Form	V Form		
$\frac{1}{16}$	$4\frac{1}{4}$	10	10	10	12, 16, 27	12, 20, 27	\$1.20	\$3.60
$\frac{1}{8}$	$4\frac{1}{4}$	10	10				1.20	3.60
$\frac{1}{4}$	$4\frac{1}{2}$	10	10	10	12	12	1.40	4.20
$\frac{3}{8}$	$4\frac{1}{2}$	10	10				1.40	4.20
$\frac{1}{2}$	$4\frac{1}{2}$	9	9	9	12, 14, 18, 27	10, 12, 27	1.60	4.80
$\frac{5}{8}$	$4\frac{1}{2}$	9	9				1.60	4.80
$\frac{3}{4}$	$4\frac{3}{4}$	9	9	9	12	12	1.80	5.40
$\frac{7}{8}$	$4\frac{3}{4}$	9	9				1.80	5.40
1	$5\frac{1}{8}$	8	8	8	12, 14, 27	12, 27	2.00	6.00
$1\frac{1}{8}$	$5\frac{1}{8}$	8	8				2.00	6.00
$1\frac{1}{4}$	$5\frac{1}{8}$	8	8			12	2.15	6.45
$1\frac{1}{2}$	$5\frac{1}{8}$	7	7	7	12	8, 12	2.25	6.75
$1\frac{3}{4}$	$5\frac{1}{8}$	7	7				2.25	6.75
$1\frac{5}{8}$	$5\frac{1}{8}$	7	7				2.45	7.35
$1\frac{3}{2}$	$5\frac{3}{4}$	7	7	7	12	12	2.60	7.80
$1\frac{7}{8}$	$5\frac{3}{4}$	7	7				2.60	7.80
$1\frac{9}{8}$	$5\frac{3}{4}$	7	7				2.80	8.40
$1\frac{5}{4}$	$6\frac{1}{8}$	6	6	6	12		3.00	9.00
$1\frac{11}{8}$	$6\frac{1}{8}$	6	6				3.00	9.00
$1\frac{3}{2}$	$6\frac{1}{8}$	6	6				3.25	9.75
$1\frac{7}{4}$	$6\frac{3}{8}$	6	6	6	12		3.50	10.50
$1\frac{9}{4}$	$6\frac{3}{8}$	6	6				3.50	10.50

Orders will be filled with United States Standard threads unless otherwise specified.

* Discounts change here.



Machinists' Hand Taps

(Concluded)

Diameter	Total Length, Inches	Standard Number of Threads			Price	
		U. S. S.	V	Whit.	Each	Per Set
1 ³ / ₈	6 ¹¹ / ₁₆	5 ¹ / ₂	5	5	\$ 4.20	\$12.00
1 ¹ / ₂	6 ¹¹ / ₁₆	5 ¹ / ₂	5		4.20	12.00
1 ³ / ₄	7	5	5	5	5.00	15.00
1 ⁷ / ₈	7	5	5		5.00	15.00
1 ⁷ / ₈	7 ⁵ / ₁₆	5	4 ¹ / ₂	4 ¹ / ₂	5.80	17.40
1 ³ / ₂	7 ¹ / ₂	5	4 ¹ / ₂		5.80	17.40
2	7 ³ / ₈	4 ¹ / ₂	4 ¹ / ₂	4 ¹ / ₂	6.70	20.10
* 2 ¹ / ₈	8	4 ¹ / ₂	4 ¹ / ₂	4 ¹ / ₂	8.00	24.00
2 ¹ / ₄	8 ¹ / ₄	4 ¹ / ₂	4 ¹ / ₂	4	9.20	27.60
2 ³ / ₈	8 ¹ / ₂	4	4 ¹ / ₂	4	10.50	31.50
2 ¹ / ₂	8 ³ / ₄	4	4	4	11.50	34.50
2 ³ / ₈	9	4	4	4	13.00	39.00
2 ³ / ₄	9 ¹ / ₄	4	4	3 ¹ / ₂	14.00	42.00
2 ⁷ / ₈	9 ¹ / ₂	3 ¹ / ₂	4	3 ¹ / ₂	15.50	46.50
3	9 ³ / ₄	3 ¹ / ₂	3 ¹ / ₂	3 ¹ / ₂	17.00	51.00
* 3 ¹ / ₈	9 ³ / ₄	3 ¹ / ₂	3 ¹ / ₂	3 ¹ / ₂	18.75	56.25
3 ¹ / ₄	10	3 ¹ / ₂	3 ¹ / ₂	3 ¹ / ₄	20.50	61.50
3 ³ / ₈	10	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	22.00	66.00
3 ¹ / ₂	10 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	24.00	72.00
3 ³ / ₈	10 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	26.00	78.00
3 ³ / ₄	10 ¹ / ₂	3	3	3	28.50	85.50
3 ⁷ / ₈	10 ¹ / ₂	3	3	3	30.00	90.00
4	10 ³ / ₄	3	3	3	32.50	97.50

We also furnish taps from 2" to 4" inclusive, ¹/₂" oversize, in V and U. S. Standard form threads.

* Discounts change at these points.



Nut Taps

All orders will be filled with U. S. Standard threads, unless otherwise specified.

Nut taps with threads conforming to the standard adopted by the automobile manufacturers, formerly called A. L. A. M., now S. A. E. Standard, and having U. S. Form threads, are included in this list.

All sizes, lengths and threads not listed are special, and subject to special prices.

All nut taps with Left-Hand threads are special.



Nut Taps

Diam-eter	Total Length, Inches	Number of Threads per Inch					Price Each
		Standard Number of Threads			Other Threads Furnished		
		U. S. S.	V	Whit.	U. S. Form	V Form	
$\frac{3}{16}$	4 $\frac{1}{2}$	24	24	24	30, 32	30, 32	\$.60
$\frac{1}{8}$	4 $\frac{1}{2}$	32	24			32	.60
$\frac{7}{32}$	4 $\frac{1}{2}$	28	24	24	32	32	.60
$\frac{1}{4}$	5	20	20	20	24, 28	24	.60
$\frac{11}{64}$	5	20	20				.60
$\frac{9}{32}$	5	20	20				.60
$\frac{5}{16}$	5 $\frac{1}{2}$	18	18	18	20, 24	16, 20, 24	.70
$\frac{3}{16}$	5 $\frac{1}{2}$	18	18				.70
$\frac{11}{32}$	5 $\frac{1}{2}$	18	18				.70
$\frac{3}{8}$	6	16	16	16	20, 24	14, 18	.80
$\frac{21}{64}$	6	16	16				.80
$\frac{13}{32}$	6	16	16				.80
$\frac{7}{16}$	6 $\frac{1}{2}$	14	14	14	20	12, 16	.90
$\frac{23}{64}$	6 $\frac{1}{2}$	14	14				.90
$\frac{15}{32}$	6 $\frac{1}{2}$	14	14				.90
$\frac{1}{2}$	7	13	12	12	12, 20	13	1.00
$\frac{25}{64}$	7	13	12		12	13	1.00
$\frac{17}{32}$	7	13	12		12	13	1.00
$\frac{9}{16}$	7 $\frac{1}{2}$	12	12	12	18	14	1.15
$\frac{27}{64}$	7 $\frac{1}{2}$	12	12				1.15
$\frac{19}{32}$	7 $\frac{1}{2}$	12	12				1.15
$\frac{5}{8}$	8	11	11	11	18	10, 12	1.30
$\frac{31}{64}$	8	11	11				1.30
$\frac{33}{64}$	8	11	11				1.30



Nut Taps

(Continued)

Diam- eter	Total Length, Inches	Number of Threads per Inch					Price Each
		Standard Number of Threads			Other Threads Furnished		
		U. S. S.	V.	Whit.	U. S. Form	V Form	
1/16	8 1/2	11	11	11	16	12	\$1.45
1/8	8 1/2	11	11				1.45
3/16	9	10	10	10	16	12	1.60
1/4	9	10	10				1.60
5/16	9 1/2	10	10	10		12	1.80
3/8	9 1/2	10	10				1.80
7/16	10	9	9	9	14, 18	10, 12	2.10
1/2	10	9	9				2.10
5/8	10 1/2	9	9	9		12	2.40
3/4	10 1/2	9	9				2.40
7/8	11	8	8	8	14	12	3.15
1	11	8	8				3.15
1 1/8	11	8	8				3.40
1 1/4	11 1/2	7	7	7	12	8	3.60
1 1/8	11 1/2	7	7				3.60
1 1/4	11 1/2	7	7				3.90
1 1/2	12	7	7	7	12		4.25
1 3/4	12	7	7				4.25
1 5/8	12	7	7				4.50
1 3/8	12 1/2	6	6	6	12		4.80
1 1/2	12 1/2	6	6				4.80
1 5/8	12 1/2	6	6				5.00
1 7/8	13	6	6	6	12		5.65
1 3/4	13	6	6				5.65



Nut Taps

(Concluded)

Diameter	Total Length, Inches	Standard Number of Threads			Price Each
		U. S. S.	V	Whit.	
1 $\frac{1}{8}$	13 $\frac{1}{2}$	5 $\frac{1}{2}$	5	5	\$6.50
1 $\frac{1}{4}$	13 $\frac{1}{2}$	5 $\frac{1}{2}$	5		6.50
1 $\frac{3}{8}$	14	5	5	5	7.20
1 $\frac{1}{2}$	14	5	5		7.20
1 $\frac{7}{8}$	14 $\frac{1}{2}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	8.25
1 $\frac{3}{4}$	14 $\frac{1}{2}$	5	4 $\frac{1}{2}$		8.25
2	15	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	9.25
*					
2 $\frac{1}{8}$	15 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	10.80
2 $\frac{1}{4}$	16	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4	12.25
2 $\frac{3}{8}$	16 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4	13.80
2 $\frac{1}{2}$	17	4	4	4	15.00
2 $\frac{3}{4}$	17 $\frac{1}{2}$	4	4	4	16.80
2 $\frac{7}{8}$	18	4	4	3 $\frac{1}{2}$	18.00
2 $\frac{3}{4}$	18 $\frac{1}{2}$	3 $\frac{1}{2}$	4	3 $\frac{1}{2}$	19.80
3	19	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	21.60
*					
3 $\frac{1}{8}$	19 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	24.70
3 $\frac{1}{4}$	19 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{4}$	26.88
3 $\frac{3}{8}$	20	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	28.75
3 $\frac{1}{2}$	20	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	31.25
3 $\frac{5}{8}$	20 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	33.75
3 $\frac{3}{4}$	20 $\frac{1}{2}$	3	3	3	36.88
3 $\frac{7}{8}$	21	3	3	3	38.75
4	21	3	3	3	41.88

* Discounts change here.

We also furnish taps, at regular list and discount, 2" to 4" diameters, $\frac{1}{32}$ " oversize.



Machine Screw Taps

We have always had among our customers numerous large consumers of machine screw taps. These customers have all belonged to the class that demands the best, so we have kept in close touch with them, constantly watching results, and endeavoring to increase the production per tap. Our continuous efforts in this line have led to very satisfactory results, that give abundant proof of the great efficiency of our taps.

For Machine Use Tapping Steel and Brass

Our experience has led us to carry in stock machine screw taps with three styles of fluting. The conventional style is best for hand use and for most cast iron work. For machine use however, tapping steel or other tough metals, and for some classes of brass work, we can supply other styles that have proved very efficient in the hands of some of the large users of automatic machines.

We are well prepared to make to order special small taps of all kinds. The prices of these will vary with the quantities ordered.

Do not try to tap full threads with machine screw taps. It does not often happen that over 75% of the total thread depth is required, and frequently considerable less will answer just as well, and save taps and trouble.

Machine Screw Taps



Less than six taps of a size will be charged as single taps.

Taps will be furnished in sets of taper, plug and bottoming when desired, at regular prices.

All sizes and threads not listed will be considered special, and subject to special prices. Left-hand machine screw taps are special.

Screw Gauge No.	Prices		Threads per Inch		* A. S. M. E. Standard	
	Each	Per Doz.	Std No.	Threads also Furnished	Std. Thd. per Inch	Threads also Furnished
0	\$.35	\$4.00			80	
1	.35	4.00		56, 60, 64, 72	72	64
1 1/2	.35	4.00		56		
2	.35	4.00	56	48, 64	64	56
3	.35	4.00	48	40, 56	56	48
4	.35	4.00	36	32, 40, 42, 48	48	36, 40
5	.35	4.00	36	32, 40	44	36, 40
6	.35	4.00	32	30, 36, 38, 40, 48	40	32, 36
7	.35	4.00	32	30, 40	36	30, 32
8	.35	4.00	32	30, 36, 40	36	30, 32
9	.35	4.00	30	28, 32	32	24, 30
10	.35	4.00	24	28, 30, 32, 36	30	24, 32
11	.35	4.00	24	28, 30		
12	.35	4.00	24	20, 32	28	24
13	.38	4.40	22	20, 24, 32		
14	.38	4.40	20	18, 24	24	20
15	.38	4.40	20	18, 24		
16	.38	4.40	18	16, 20	22	20
18	.38	4.40	18	16, 20	20	18
20	.45	5.30	16	18	20	18
22	.45	5.50	16	18	18	16
24	.45	5.30	16	14, 18	16	18
26	.53	6.30	16	14	16	14
28	.53	6.30	14	16	14	16
30	.53	6.30	14	16	14	16

* The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page No. 78 for detailed information on screws of this standard size.



Tapper Taps

Unless otherwise specified all orders will be filled with U. S. Standard thread taps, eleven inches long, with plain round shanks.

All sizes, lengths and threads not listed are special, and subject to special prices.

Tapper taps with Left-Hand threads are special.

Taps to fit most of the well-known tapper sockets, and taps with square heads, are furnished at regular prices.

When Tapper taps are for steel nuts exclusively, orders should so specify.

Tapper taps with threads conforming to the standard adopted by the automobile manufacturers, formerly called A. L. A. M., now S. A. E. Standard, are included in this list.



Tapper Taps

Diam-eter	Length of Thread, Inches	Number of Threads per Inch				Price Each			
		Standard Number of Threads			U. S. Form also Furnished	11 Inch.	12 Inch.	14 Inch.	15 Inch.
		U. S. S.	V	Whit.					
$\frac{1}{4}$	$1\frac{3}{4}$	20	20	20	28	\$.70	\$.75	\$.80	\$.90
$\frac{1}{2}$	$1\frac{3}{4}$	20	20			.70	.75	.80	.90
$\frac{3}{8}$	$1\frac{3}{4}$	20	20			.70	.75	.80	.90
$\frac{7}{16}$	2	18	18	18	24	.80	.85	.90	1.00
$\frac{1}{2}$	2	18	18			.80	.85	.90	1.00
$\frac{9}{16}$	2	18	18			.80	.85	.90	1.00
$\frac{5}{8}$	2	16	16	16	24	.90	.95	1.00	1.10
$\frac{3}{4}$	2	16	16			.90	.95	1.00	1.10
$\frac{7}{8}$	2	16	16			.90	.95	1.00	1.10
1	$2\frac{1}{4}$	14	14	14	20	1.00	1.05	1.15	1.25
$1\frac{1}{8}$	$2\frac{1}{4}$	14	14			1.00	1.05	1.15	1.25
$1\frac{1}{4}$	$2\frac{1}{4}$	14	14			1.00	1.05	1.15	1.25
$1\frac{3}{8}$	$2\frac{1}{4}$	13	12	12	12, 20	1.12	1.15	1.25	1.35
$1\frac{1}{2}$	$2\frac{1}{4}$	13	12			1.12	1.15	1.25	1.35
$1\frac{3}{4}$	$2\frac{1}{4}$	13	12			1.12	1.15	1.25	1.35
2	$2\frac{1}{2}$	12	12	12	18	1.30	1.35	1.45	1.55
$2\frac{1}{8}$	$2\frac{1}{2}$	12	12			1.30	1.35	1.45	1.55
$2\frac{1}{4}$	$2\frac{1}{2}$	12	12			1.30	1.35	1.45	1.55
$2\frac{3}{8}$	$2\frac{1}{2}$	11	11	11	18	1.45	1.50	1.65	1.75
$2\frac{1}{2}$	$2\frac{1}{2}$	11	11			1.45	1.50	1.65	1.75
$2\frac{3}{4}$	$2\frac{1}{2}$	11	11			1.45	1.50	1.65	1.75
3	$2\frac{1}{2}$	11	11	11	16	1.62	1.70	1.80	1.95
$3\frac{1}{8}$	$2\frac{1}{2}$	11	11			1.62	1.70	1.80	1.95
$3\frac{1}{4}$	$2\frac{3}{4}$	10	10	10	16	1.80	1.85	2.00	2.10
$3\frac{3}{8}$	$2\frac{3}{4}$	10	10			1.80	1.85	2.00	2.10



Tapper Taps

(Concluded)

Diam-eter	Lenth of Thread, Inches	Number of Threads per Inch			U. S. Form also Furnished	Price Each			
		Standard Number of Threads				11 Inch.	12 Inch.	14 Inch.	15 Inch.
		U. S. S.	V	Whit.					
$\frac{1}{16}$	2 $\frac{3}{4}$	10	10	10	14, 18	\$2.05	\$2.10	\$2.25	\$2.35
$\frac{1}{8}$	2 $\frac{3}{4}$	10	10			2.05	2.10	2.25	2.35
$\frac{3}{16}$	3	9	9	9		2.35	2.45	2.60	2.75
$\frac{1}{4}$	3	9	9			2.35	2.45	2.60	2.75
$\frac{5}{16}$	3	9	9	9		2.70	2.75	3.00	3.15
$\frac{3}{8}$	3	9	9		14	2.70	2.75	3.00	3.15
$\frac{1}{2}$	3 $\frac{1}{2}$	8	8	8		3.15	3.20	3.50	3.65
$\frac{5}{8}$	3 $\frac{1}{2}$	8	8			3.15	3.20	3.50	3.65
$\frac{3}{4}$	3 $\frac{1}{2}$	7	7	7		3.60	3.70	3.95	4.10
$\frac{7}{8}$	3 $\frac{1}{2}$	7	7			3.60	3.70	3.95	4.10
1	3 $\frac{1}{2}$	7	7	7		4.15	4.25	4.50	4.65
$1\frac{1}{8}$	3 $\frac{1}{2}$	7	7			4.15	4.25	4.50	4.65
$1\frac{1}{4}$	4	6	6	6		4.70	4.80	5.05	5.20
$1\frac{1}{2}$	4	6	6			4.70	4.80	5.05	5.20
$1\frac{3}{4}$	4	6	6	6		5.30	5.40	5.65	5.80
2	4	6	6			5.30	5.40	5.65	5.80
$2\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5	5		6.10	6.30	6.50	6.65
$2\frac{1}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5			6.10	6.30	6.50	6.65
$2\frac{1}{2}$	4 $\frac{3}{4}$	5	5	5		6.70	7.00	7.20	7.40
$2\frac{3}{4}$	4 $\frac{3}{4}$	5	5			6.70	7.00	7.20	7.40
3	5	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$		7.80	8.00	8.25	8.35
$3\frac{1}{8}$	5	5	4 $\frac{1}{2}$			7.80	8.00	9.05	8.35
$3\frac{1}{4}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$		8.70	8.90	9.05	9.25
$3\frac{1}{2}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$			8.70	8.90	9.05	9.25

* Discount changes at this point.



Pulley Taps



All orders will be filled with U. S. Standard thread unless otherwise specified.

All sizes and threads not listed are special, and subject to special prices.

Pulley taps with Left-Hand threads are special.

Diam	Number of Threads to Inch			6 Inch.	8 Inch.	10 Inch.	12 Inch.	14 Inch.	16 Inch.	18 Inch.	20 Inch.	22 Inch.	24 Inch.
	U. S.	V	Whit.										
$\frac{1}{4}$	20	20	20	0.65	0.70	0.80	0.90						
$\frac{5}{16}$	18	18	18	.75	.80	1.00	1.20						
$\frac{3}{8}$	16	16	16	.80	.90	1.10	1.30	1.40	1.55	1.70			
$\frac{7}{16}$	14	14	14	.90	1.00	1.20	1.40	1.50	1.65	1.80			
$\frac{1}{2}$	*13	*12	12	1.00	1.15	1.30	1.45	1.60	1.75	1.90	2.05		
$\frac{9}{16}$	12	12	12	1.10	1.30	1.45	1.55	1.70	1.85	2.05	2.20	2.35	
$\frac{5}{8}$	11	11	11	1.20	1.35	1.50	1.60	1.75	1.90	2.10	2.25	2.40	2.55
$\frac{3}{4}$	11	11	11	1.30	1.45	1.55	1.70	1.90	2.05	2.20	2.35	2.50	2.65
$\frac{7}{8}$	10	10	10	1.40	1.50	1.60	1.80	2.00	2.15	2.30	2.45	2.60	2.75
$1\frac{1}{8}$	10	10	10	1.60	1.70	1.80	2.00	2.15	2.30	2.45	2.60	2.75	2.90
$1\frac{1}{4}$	9	9	9	1.80	1.90	2.10	2.30	2.50	2.70	2.90	3.10	3.30	3.50
$1\frac{3}{8}$	9	9	9	2.00	2.10	2.30	2.50	2.70	2.90	3.10	3.30	3.50	3.70
1	8	8	8	2.25	2.30	2.50	2.70	2.90	3.10	3.30	3.50	3.70	3.90

* Also furnished with 12 threads U. S. S., or 13 threads V form, when desired.



Short Hob Taps



All orders will be filled with U. S. Standard threads unless otherwise specified.

Also furnished in rough iron sizes at regular prices.

All sizes and pitches not listed are special, and subject to special prices.

Short hob taps with Left-Hand threads are special.

Diameter	Standard Number of Threads			U. S. Form also Furnished	Total Length, Inches	Price Each
	U. S. S.	V	Whit.			
$\frac{1}{4}$	20	20	20	28	2 $\frac{3}{4}$	\$.60
$\frac{5}{16}$	18	18	18	24	3 $\frac{1}{4}$	.70
$\frac{3}{8}$	16	16	16	24	3 $\frac{1}{2}$	.80
$\frac{7}{16}$	14	14	14	20	3 $\frac{3}{4}$	.90
$\frac{1}{2}$	13	12	12	12, 20	4	1.00
$\frac{9}{16}$	12	12	12	18	4 $\frac{1}{4}$	1.15
$\frac{5}{8}$	11	11	11	18	4 $\frac{1}{2}$	1.30
$\frac{11}{16}$	11	11	11	16	4 $\frac{3}{4}$	1.45
$\frac{3}{4}$	10	10	10	16	5	1.60
$\frac{13}{16}$	10	10	10		5 $\frac{1}{4}$	1.80
$\frac{7}{8}$	9	9	9	14, 18	5 $\frac{1}{2}$	2.10
$\frac{15}{16}$	9	9	9		5 $\frac{3}{4}$	2.40
1	8	8	8	14	6	2.80
1 $\frac{1}{8}$	7	7	7		6 $\frac{1}{4}$	3.20
1 $\frac{1}{4}$	7	7	7		6 $\frac{3}{4}$	3.70
1 $\frac{3}{8}$	6	6	6		7	4.20
1 $\frac{1}{2}$	6	6	6		7 $\frac{1}{4}$	4.70
1 $\frac{3}{4}$	5 $\frac{1}{2}$	5	5		8	5.30
1 $\frac{7}{8}$	5	5	5		8 $\frac{1}{2}$	6.00
1 $\frac{7}{8}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$		9	6.80
2	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$		9 $\frac{1}{2}$	7.70



Long Hob or Master Taps



All orders filled with U. S. Standard threads unless otherwise specified.

We also furnish hob taps in rough iron sizes at regular prices.

All sizes and pitches not listed are special, and subject to special prices.

Long hob taps with Left-Hand threads are special.

Diameter	Standard Number of Threads			U. S. Form also Furnished	Total Length, Inches	Price Each
	U. S. S.	V	Whit.			
$\frac{1}{4}$	20	20	20	28	3½	\$.75
$\frac{3}{16}$	18	18	18	24	4	.87
$\frac{1}{2}$	16	16	16	24	4½	1.00
$\frac{7}{16}$	14	14	14	20	5	1.12
$\frac{1}{2}$	13	12	12	12, 20	5½	1.25
$\frac{9}{16}$	12	12	12	18	6	1.44
$\frac{5}{8}$	11	11	11	18	6½	1.62
$\frac{3}{4}$	11	11	11	16	7	1.81
$\frac{7}{8}$	10	10	10	16	7½	2.00
$\frac{1}{2}$	10	10	10		8	2.25
$\frac{7}{8}$	9	9	9	14, 18	8½	2.62
$\frac{1}{2}$	9	9	9		8¾	3.00
1	8	8	8	14	9	3.50
$1\frac{1}{8}$	7	7	7		9¼	4.00
$1\frac{1}{4}$	7	7	7		9½	4.62
$1\frac{3}{8}$	6	6	6		9¾	5.25
$1\frac{1}{2}$	6	6	6		10	5.87
$1\frac{3}{4}$	5½	5	5		10¼	6.62
$1\frac{1}{2}$	5	5	5		10½	7.50
$1\frac{7}{8}$	5	4½	4½		10¾	8.50
2	4½	4½	4½		11	9.62



Straight and Taper Boiler Taps



Straight



Taper

Also furnished $\frac{1}{2}^{\circ}$ oversize, when so desired, in sizes up to $1\frac{1}{4}^{\circ}$ diameter.

Diameter	Number of Threads	Price Each	Diameter	Number of Threads	Price Each
$\frac{1}{2}$	12	\$1.00	$1\frac{3}{16}$	12	\$4.00
$\frac{3}{16}$	12	1.15	$1\frac{1}{8}$	12	4.30
$\frac{3}{8}$	12	1.30	$1\frac{7}{16}$	12	4.60
$\frac{11}{16}$	12	1.45	$1\frac{1}{2}$	12	4.90
$\frac{3}{4}$	12	1.60	$1\frac{5}{8}$	12	5.10
$\frac{13}{16}$	12	1.80	$1\frac{3}{4}$	12	5.40
$\frac{7}{8}$	12	2.10	$1\frac{7}{8}$	12	5.70
$\frac{15}{16}$	12	2.40	2	12	6.00
1	12	2.80	$2\frac{1}{8}$	12	6.50
$1\frac{1}{16}$	12	3.00	$2\frac{1}{4}$	12	7.00
$1\frac{1}{8}$	12	3.20	$2\frac{3}{8}$	12	7.50
$1\frac{3}{8}$	12	3.40	$2\frac{1}{2}$	12	8.00
$1\frac{1}{4}$	12	3.70			

Patch Bolt Taps



These taps are slightly tapered to make a steam-tight fit.
Also furnished $\frac{1}{32}$ " oversize, when so desired.

Diameter	Number of Threads	Price Each	Diameter	Number of Threads	Price Each
$\frac{1}{2}$	12	\$.70	$\frac{1}{2}$	12	\$1.80
$\frac{5}{16}$	12	.80	1	12	2.00
$\frac{3}{8}$	12	.90	$1\frac{1}{8}$	12	2.15
$\frac{1}{2}$	12	1.05	$1\frac{1}{4}$	12	2.25
$\frac{3}{4}$	12	1.20	$1\frac{3}{4}$	12	2.45
$1\frac{1}{8}$	12	1.40	$1\frac{1}{2}$	12	2.60
$1\frac{1}{4}$	12	1.60			

Taps for Beaman & Smith Holders



All orders filled with U. S. Standard threads unless otherwise specified.

Taps with V Standard threads and S. A. E. (formerly A. L. A. M.) Standard threads furnished at regular prices.

Taps with Left-Hand threads are special.

Diameter	Fitting No. 1 Holder		Diameter	Fitting No. 2 Holder	
	Number of Threads	Price Each		Number of Threads	Price Each
$\frac{1}{4}$	20	\$.45	$\frac{3}{8}$	11	\$.90
$\frac{1}{2}$	18	.50	$1\frac{1}{8}$	11	1.05
$\frac{3}{8}$	16	.55	$1\frac{1}{4}$	10	1.20
$\frac{1}{2}$	14	.60	$1\frac{3}{4}$	10	1.40
$\frac{3}{4}$	12, 13	.70	$1\frac{1}{2}$	9	1.60
$1\frac{1}{8}$	12	.80	$1\frac{3}{4}$	9	1.80
$1\frac{1}{4}$	11	.90	1	8	2.00
			$1\frac{1}{8}$	7	2.25
			$1\frac{1}{4}$	7	2.60



Stove Bolt Taps



We make our Stove Bolt taps to correspond to the American Screw Co.'s Stove Bolts.

Less than six of a size will be charged as single taps.

All sizes and threads not listed are special, and subject to special prices.

Diameter	Standard Number of Threads	Price Each	Per Dozen
$\frac{5}{16}$	28	\$.35	\$4.00
$\frac{3}{8}$	24	.35	4.00
$\frac{1}{2}$	22	.35	4.00
$\frac{5}{8}$	18	.38	4.40
$\frac{3}{4}$	18	.38	4.40
$\frac{7}{8}$	16	.45	5.30

Hand Screw Chasers



These chasers are furnished in V thread only.

All threads not listed are special, and subject to special prices.

	Each	Per Pair
Cutting 5, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15 and 16 threads per inch	\$.30	\$.60
Cutting 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 56, 60, 62, 64 and 70 threads per inch .....	.25	.50

Stay-Bolt Taps



In ordering stay-bolt taps, state diameter and number of threads to the inch; also length and dimensions of parts as indicated in the cut by letters A, B, C, D, E.

All stay-bolt taps will be furnished with 12 V threads to the inch, unless otherwise specified.

Stay-bolt taps with 12 threads to the inch, U. S. and Whitworth Standard forms, furnished at regular list and discount.

The diameter given is that of the thread at its straight part.

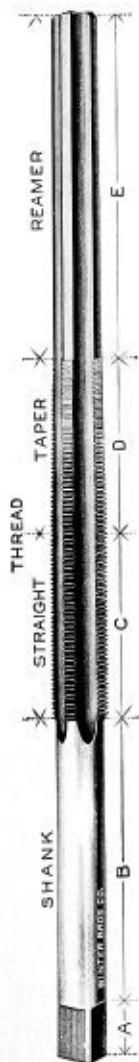
Prices are for each inch of length, 16 inches and upwards.

Taps shorter than 16 inches will be charged as if 16 inches long.

Blank order slips will be furnished on application.

Diameter, Inches	Price per Inch
$\frac{3}{4}$ to $\frac{7}{8}$, inclusive	\$.40
$\frac{1}{2}$ to 1, inclusive	.45
$1\frac{1}{16}$ to $1\frac{1}{8}$, inclusive	.50
$1\frac{1}{8}$ to $1\frac{1}{4}$, inclusive	.55
$1\frac{1}{4}$ to $1\frac{3}{8}$, inclusive	.60
$1\frac{3}{8}$ to $1\frac{1}{2}$, inclusive	.70

We make spindle stay-bolt taps to order.





Pipe Taps and Reamers

Pipe Hobs



Tap



Hob



Reamer

Straight and taper pipe taps at regular prices.

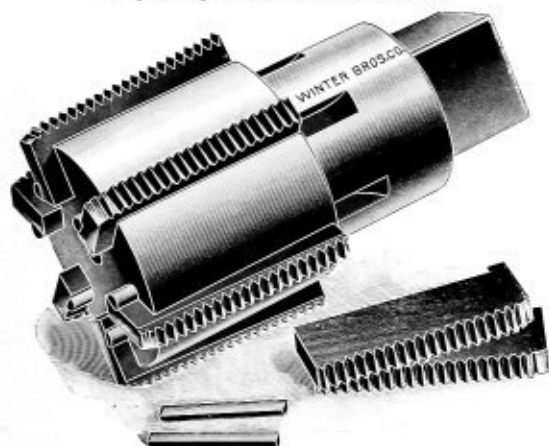
When ordering specify whether right or left-hand thread is wanted.

Diameter	Price	Diameter	Price	Diameter	Price
$\frac{1}{8}$	\$1.12	1	\$3.12	$2\frac{1}{2}$	\$10.50
$\frac{1}{4}$	1.25	$1\frac{1}{4}$	3.75	*3	15.00
$\frac{3}{8}$	1.50	$1\frac{1}{2}$	4.62	* $3\frac{1}{2}$	22.00
$\frac{1}{2}$	1.87	2	6.25	*4	33.00
$\frac{3}{4}$	2.50				

* These prices for 3" and larger apply to hobs only. All our pipe taps 3" and larger are made in the inserted chaser style only. (See next page.) The $2\frac{1}{2}$ " size is made either solid or with inserted chasers.



Pipe Taps with Inserted Chasers



This style of tap has been thoroughly tested and approved by our most particular customers.

High-Speed steel taps of this style are especially economical. (See list on page 66).

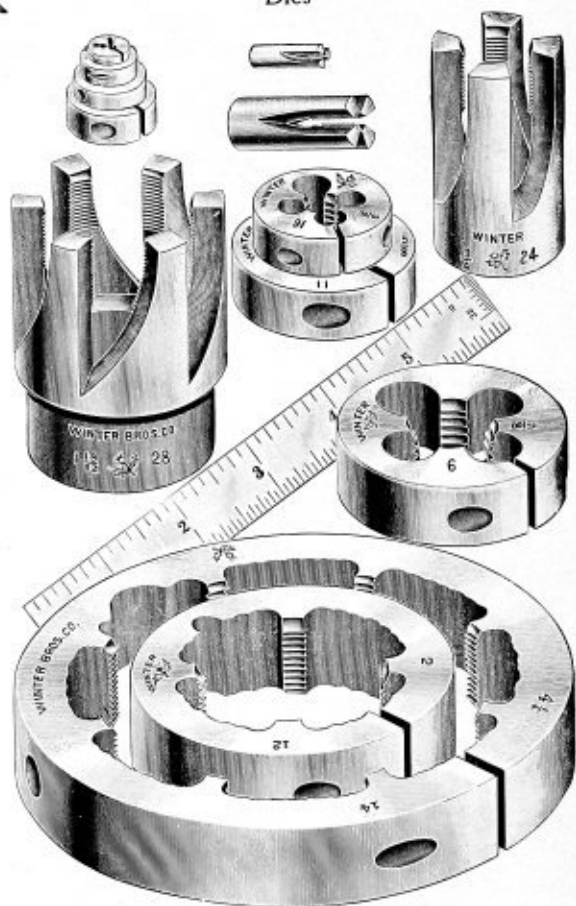
Size	Prices		Size	Prices	
	Tap Complete	Chasers Per Set		Tap Complete	Chasers Per Set
2½	\$ 9.00	\$3.50	6	\$28.00	\$5.00
3	10.00	3.50	7	35.00	5.00
3½	11.50	3.50	8	42.00	5.00
4	14.50	3.50	9	50.00	5.00
4½	18.00	3.50	10	60.00	5.00
5	22.00	5.00			

Sizes up to 4" are carried in stock, and prices on these sizes are subject to discount. The larger sizes are made to order only.

Large taps of all kinds made to order in this style.



Dies





Dies

We have gained a very broad experience with thread cutting dies by our direct contact with a large number of the best known producers of automatic screw machine work.

Unless otherwise ordered, all of our Carbon steel round dies, larger than $\frac{3}{8}$ " outside diameter, are split through one side and adjusted by means of an easily operated screw; but we can furnish solid round dies, or split dies slotted for the points of three set screws, so that they can be adjusted in the die holder.

When work must be threaded close up to a shoulder, specify this fact on your order.

If dies are to be used exclusively on brass, we should be so informed.

We are prepared to furnish relieved dies in sizes larger than $\frac{1}{4}$ ", at a small extra cost. They are sometimes desirable for brass work, and for cutting tapering threads for pipe fittings.

When threads of more than ordinary accuracy in the lead are required, we can supply dies with their lead corrected after hardening.

We list many sizes of round dies in which the cutting size is too large in proportion to the outside diameter. If you wish the best results, keep within the limits marked in the lists on the following pages.

In the case of special dies, when hobs or other tools must be made, their cost will be charged to the first order, and the tools will remain in our possession.

We advise the use of the U. S. Standard threads. It is best to always specify the form of thread on your order.



Adjustable Round Dies



No. 1

$\frac{5}{8}$ " Diameter, $\frac{1}{4}$ " Thick — Machine Screw Sizes

All sizes and threads not listed are special, and subject to special prices.

Dies with Left-Hand threads are special.

Read page 35.

Size No.	Standard Thread	Threads also Furnished	*A. S. M. E. Standard		Price Each
			Std. Thds. per Inch	Threads also Furnished	
0			80		\$.40
1		56, 60, 64, 72	72	64	.40
1½		56			.40
2	56	48, 64	64	56	.40
3	48	40, 56	56	48	.40
4	36	32, 40, 42, 48	48	36, 40	.40
5	36	32, 40	44	36, 40	.40
6	32	30, 36, 38, 40, 48	40	32, 36	.40
7	32	30, 40	36	30, 32	.40
8	32	30, 36, 40	36	30, 32	.40
† 9	30	28, 32	32	24, 30	.40
10	24	28, 30, 32, 36	30	24, 32	.40
11	24	28, 30			.40
12	24	20, 32	28	24	.40
13	22	20, 24, 32			.40
14	20	18, 24	24	20	.40

* The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 78 for detailed information of screws of this standard.

† For the best results, especially in automatic screw machine work, we strongly advise against using $\frac{5}{8}$ " diameter dies to cut sizes larger than No. 8.



Adjustable Round Dies

No. 1

$\frac{5}{8}$ " Diameter, $\frac{1}{4}$ " Thick

(Concluded)

All sizes and threads not listed are special.
Dies with Left-Hand threads are special.

Cutting Size	U. S. Std.	V Std.	Whitworth Standard	U. S. Form	V Threads also Furnished	Price Each
$\frac{1}{16}$		72	60	64	64	\$.40
$\frac{3}{64}$		72		56	56	.40
$\frac{1}{8}$		56	48	48, 50	48	.40
$\frac{3}{16}$		56		48	48	.40
$\frac{1}{4}$		40	40	40, 48, 50	48, 50	.40
$\frac{5}{16}$		40		32, 40	32	.40
$\frac{3}{8}$		32	32	36, 40	36, 40	.40
$\frac{7}{16}$		32		32		.40
* $\frac{1}{2}$		24	24	24, 30, 32	30, 32	.40
$\frac{5}{8}$		24		32	32	.40
$\frac{3}{4}$		24	24	28, 32	32	.40
$\frac{7}{8}$		24		24, 32	32	.40
$1\frac{1}{4}$	20	20	20	24, 27, 28	24, 27, 32	.40
$1\frac{1}{2}$	20	20				.40

* For the best results, especially for automatic screw machine use, we advise against the use of $\frac{5}{8}$ " diameter dies to cut sizes larger than $\frac{1}{2}$ ".



Adjustable Round Dies



No. 2

$\frac{1}{16}$ " Diameter, $\frac{1}{4}$ " Thick — Machine Screw Sizes

All sizes and threads not listed are special, and subject to special prices.

Dies with Left-Hand threads are special.

Read page 35.

Size No.	Standard Number of Threads	Threads also Furnished	*A. S. M. E. Standard		Price Each
			Std. Thds. per Inch	Threads also Furnished	
0			80		\$.40
1		56, 60, 64, 72	72	64	.40
$1\frac{1}{2}$		56			.40
2	56	48, 64	64	56	.40
3	48	40, 56	56	48	.40
4	36	32, 40, 42, 48	48	36, 40	.40
5	36	32, 40	44	36, 40	.40
6	32	30, 36, 38, 40, 48	40	32, 36	.40
7	32	30, 40	36	30, 32	.40
8	32	30, 36, 40	36	30, 32	.40
9	30	28, 32	32	24, 30	.40
10	24	28, 30, 32, 36	30	24, 32	.40
11	24	28, 30			.40
12	24	20, 32	28	24	.40
†					
13	22	20, 24, 32			.40
14	20	18, 24	24	20	.40
15	20	18, 24			.40
16	18	16, 20	22	20	.40

* The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 78 for detailed information on screws of this standard.

† For the best results, especially in automatic screw machine work, we strongly advise against using $\frac{1}{16}$ " diameter dies to cut sizes larger than No. 12.



Adjustable Round Dies

No. 2

$\frac{1}{4}$ " Diameter, $\frac{1}{4}$ " Thick

(Concluded)

All sizes and threads not listed are special.
Dies with Left-Hand threads are special.
Read page 35.

Cutting Size	U. S. Std.	V Std.	Whitworth Standard	U. S. Form	V Threads also Furnished	Price Each
$\frac{1}{16}$		72	60	64	64	\$.40
$\frac{3}{32}$		72		56	56	.40
$\frac{1}{8}$		56	48	48, 50	48	.40
$\frac{5}{16}$		56		48	48	.40
$\frac{3}{8}$		40	40	40, 48, 50	48, 50	.40
$\frac{7}{16}$		40		32, 40	32	.40
$\frac{1}{2}$		32	32	36, 40	36, 40	.40
$\frac{9}{16}$		32		32		.40
$\frac{5}{8}$		24	24	24, 30, 32	30, 32	.40
$\frac{11}{16}$		24		32	32	.40
$\frac{3}{4}$		24	24	28, 32	32	.40
$\frac{7}{8}$		24		24, 32	32	.40
* $\frac{1}{4}$	20	20	20	24, 27, 28	24, 27, 32	.40
$\frac{1}{2}$	20	20				.40
$\frac{3}{4}$	20	20				.40
$\frac{1}{2}$	18	18	18	20, 24, 27	20, 24, 27, 32	.40

*For best results, especially for automatic screw machine use, we advise against the use of $\frac{1}{16}$ " diameter dies to cut sizes larger than $\frac{1}{16}$ ".



Adjustable Round Dies



No. 3

1" Diameter, $\frac{3}{8}$ " Thick — Machine Screw Sizes

All sizes and threads not listed are special and subject to special prices.

Left-Hand dies are special.

Read page 35.

Size No.	Standard Thread	Threads also Furnished	*A. S. M. E. Standard Thread	Standard Threads also Furnished	Price Each
4	36	32, 40, 42, 48	48	36, 40	\$.75
5	36	32, 40	44	36, 40	.75
6	32	30, 36, 38, 40, 48	40	32, 36	.75
7	32	30, 40	36	30, 32	.75
8	32	30, 36, 40	36	30, 32	.75
9	30	28, 32	32	24, 30	.75
10	24	28, 30, 32, 36	30	24, 32	.75
11	24	28, 30			.75
12	24	20, 32	28	24	.75
13	22	20, 24, 32			.75
14	20	18, 24	24	20	.75
15	20	18, 24			.75
16	18	16, 20	22	20	.75
† 18	18	16, 20	20	18	.75
20	16	18	20	18	.75
22	16	18	18	16	.75
24	16	14, 18	16	18	.75

* The above standard for machine screws has been approved by the American Society of Mechanical Engineers. See page 78 for detailed information on screws of this standard.

† For best results, especially in automatic screw machine work, we strongly advise against using dies 1" diameter to cut sizes larger than No. 16.



Adjustable Round Dies

No. 3

1" Diameter, $\frac{3}{8}$ " Thick

(Concluded)

U. S. Standard thread will be sent unless otherwise specified.
All sizes and threads not listed are special.
Dies with Left-Hand threads are special.
Read page 35.

Cutting Size	U. S. Std.	V Std.	Whit. Std.	U. S. Form	V Threads also Furnished	Price Each
$\frac{1}{8}$		40	40	40, 48, 50	48, 50	\$.75
$\frac{3}{16}$		40		32, 40	32	.75
$\frac{1}{4}$		32	32	36, 40	36, 40	.75
$\frac{5}{16}$		32		32		.75
$\frac{3}{8}$		24	24	24, 30, 32	30, 32	.75
$\frac{7}{16}$		24		32	32	.75
$\frac{1}{2}$		24	24	28, 32	32	.75
$\frac{5}{8}$		24		24, 32	32	.75
$\frac{3}{4}$	20	20	20	24, 27, 28	24, 27, 32	.75
$\frac{7}{8}$	20	20				.75
$\frac{15}{16}$	20	20				.75
*						
$\frac{1}{16}$	18	18	18	20, 24, 27	20, 24, 27, 32	.75
$\frac{1}{8}$	18	18				.75
$\frac{3}{16}$	18	18				.75
$\frac{1}{4}$	16	16	16	20, 24, 27	14, 18, 20, 24, 27	.75
$\frac{5}{16}$	16	16				.75
$\frac{3}{8}$	16	16				.75
$\frac{7}{16}$	14	14	14	20, 27	12, 16, 20, 24, 27	.75

* For best results, especially for automatic screw machine work, we advise against the use of 1" diameter dies to cut sizes larger than $\frac{9}{16}$ ", excepting for fine pitches.



Adjustable Round Dies



No. 3 1/2

1 5/16" Diameter, 1 1/16" Thick — Machine Screw Sizes

All sizes and threads not listed are special.

Left-Hand dies are special.

Read page 35.

Size No.	Standard Thread	Threads also Furnished	*A. S. M. E. Standard		Price Each
			Standard Thread	Threads also Furnished	
10	24	28, 30, 32, 36	30	24, 32	\$1.00
11	24	28, 30			1.00
12	24	20, 32	28	24	1.00
13	22	20, 24, 32			1.00
14	20	18, 24	24	20	1.00
15	20	18, 24			1.00
16	18	16, 20	22	20	1.00
18	18	16, 20	20	18	1.00
20	16	18	20	18	1.00
22	16	18	18	16	1.00
24	16	14, 18	16	18	1.00
26	16	14	16	14	1.00
†					
28	14	16	14	16	1.00
30	14	16	14	16	1.00

* See page 78 for detailed information in regard to this standard, which has been approved by the American Society of Mechanical Engineers.

† For the best results, especially for automatic screw machine work, we strongly advise against using 1 5/16" diameter dies to cut sizes larger than No. 26.



Adjustable Round Dies

No. 3 $\frac{1}{2}$

$1\frac{5}{16}$ " Diameter, $\frac{7}{16}$ " Thick

(Concluded)

U. S. Standard threads will be sent unless otherwise ordered.

All sizes and threads not listed are special.

Dies with Left-Hand threads are special.

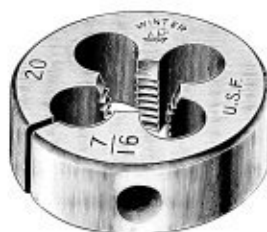
Read page 35.

Cutting Size	U. S. Std.	V Std.	Whit. Std.	U. S. Form	V Threads also Furnished	Price Each
$\frac{3}{16}$		24	24	24, 30, 32	30, 32	\$1.00
$\frac{7}{32}$		24		32	32	1.00
$\frac{1}{4}$		24	24	28, 32	32	1.00
$\frac{5}{16}$		24		24, 32	32	1.00
$\frac{3}{8}$	20	20	20	24, 27, 28	24, 27, 32	1.00
$\frac{7}{16}$	20	20				1.00
$\frac{1}{2}$	20	20				1.00
$\frac{5}{8}$	18	18	18	20, 24, 27	20, 24, 27, 32	1.00
$\frac{3}{4}$	18	18				1.00
$\frac{7}{8}$	18	18				1.00
$1\frac{1}{8}$	16	16	16	20, 24, 27	14, 18, 20, 24, 27	1.00
$1\frac{1}{4}$	16	16				1.00
$1\frac{3}{8}$	16	16				1.00
$1\frac{1}{2}$						
$1\frac{3}{4}$	14	14	14	20, 27	12, 16, 20, 24, 27	1.00
2	14	14				1.00
$2\frac{1}{4}$	14	14				1.00
$2\frac{1}{2}$	13	12	12	12, 20, 27	13, 14, 16, 20, 24, 27	1.00
$2\frac{3}{4}$	13	12		12	13	1.00
3	13	12		12	13	1.00

* We advise against the use of $1\frac{5}{16}$ " diameter dies to cut sizes larger than $\frac{3}{8}$ ", excepting for fine pitches.



Adjustable Round Dies



No. 4

1 1/2" Diameter, 1/2" Thick

No. 5

2" Diameter, 5/8" Thick

All orders filled with U. S. Standard thread, unless otherwise specified.

All sizes and threads not listed are special, and subject to special prices.

Dies with Left-Hand threads are special.

Read page 35.

Size	U. S. Std.	V Std.	Whit Std.	U. S. Form	V Threads also Furnished	Price Each	
						No. 4	No. 5
1/4	20	20	20	24, 27, 28	24, 27, 32	\$1.00	\$1.25
1/4	20	20				1.00	1.25
3/8	20	20				1.00	1.25
1/2	18	18	18	20, 24, 27	20, 24, 27, 32	1.00	1.25
3/4	18	18				1.00	1.25
1	18	18				1.00	1.25
1 1/8	16	16	16	20, 24, 27	14, 18, 20, 24, 27	1.00	1.25
1 1/4	16	16				1.00	1.25
1 1/2	16	16				1.00	1.25
1 3/4	14	14	14	20, 27	12, 16, 20, 24, 27	1.00	1.25



Adjustable Round Dies

No. 4

$1\frac{1}{2}^{\circ}$ Diameter, $\frac{1}{2}^{\circ}$ Thick

No. 5

2° Diameter, $\frac{5}{8}^{\circ}$ Thick

(Concluded)

All orders filled with U. S. Standard threads unless otherwise specified.

All sizes and threads not listed are special.

Dies with Left-Hand threads are special.

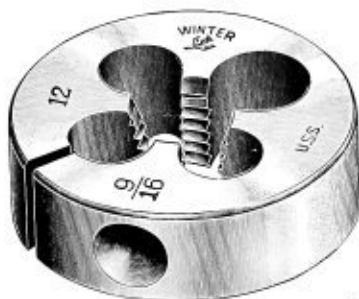
Read page 35.

Size	U. S. Std.	V Std.	Whit. Std.	U. S. Form	V Threads also Furnished	Price Each	
						No. 4	No. 5
$\frac{1}{16}$	14	14				\$1.00	\$1.25
$\frac{1}{8}$	14	14				1.00	1.25
$\frac{3}{16}$	13	12	12	12, 20, 27	13, 14, 16, 20, 24, 27	1.00	1.25
$\frac{1}{4}$	13	12		12	13	1.00	1.25
$\frac{5}{16}$	13	12		12	13	1.00	1.25
$\frac{3}{8}$	12	12	12	18, 27	14, 27	1.15	1.50
$\frac{7}{16}$	12	12				1.15	1.50
$\frac{1}{2}$	12	12				1.15	1.50
$\frac{9}{16}$	11	11	11	12, 18, 27	10, 12, 20, 24, 27	1.25	1.50
$\frac{5}{8}$	11	11				1.25	1.50
$\frac{11}{16}$	11	11				1.25	1.50
$\frac{3}{4}$	11	11	11	12, 16	10, 12		1.75
$\frac{7}{8}$	11	11					1.75
1	10	10	10	12, 16, 27	12, 20, 27		1.75
$1\frac{1}{8}$	10	10					1.75

* For best results, No. 4 dies should not be used to cut larger than $\frac{1}{16}^{\circ}$; or No. 5 dies, not larger than $\frac{3}{16}^{\circ}$, excepting in the fine pitches.



Adjustable Round Dies



No. 6
2½" Diameter, ¾" Thick

No. 7
3" Diameter, 1" Thick

All orders will be filled with U. S. Standard thread, unless otherwise specified.

All sizes and threads not listed are special.

Dies with Left-Hand threads are special.

Read page 35.

Size	U. S. Std.	V Std.	Whit. Std.	U. S. Form	V Threads also Furnished	Price Each	
						No. 6	No. 7
¼	20	20	20	24, 27, 28	24, 27, 32	\$1.50	\$
⅜	20	20				1.50	
½	18	18	18	20, 24, 27	20, 24, 27, 32	1.50	
⅝	18	18				1.50	
¾	16	16	16	20, 24, 27	14, 18, 20, 24, 27	1.50	
7/8	16	16				1.50	
1	14	14	14	20, 27	12, 16, 20, 24, 27	1.50	
1 1/8	14	14				1.50	
1 1/4	13	12	12	12, 20, 27	13, 14, 16, 20, 24, 27	1.50	2.50
1 1/2	13	12		12	13	1.50	2.50
1 3/4	12	12	12	18, 27	14, 27	1.75	2.75
2	12	12				1.75	2.75



Adjustable Round Dies

No. 6

2½" Diameter, ¾" Thick

No. 7

3" Diameter, 1" Thick

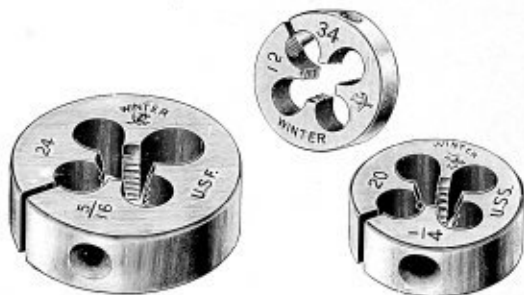
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Size	U. S. Std.	V Std.	Whit. Std.	U. S. Form	V Threads also Furnished	Price Each	
						No. 6	No. 7
⅝	11	11	11	12, 18, 27	10, 12, 20, 24, 27	\$1.75	\$2.75
⅞	11	11				1.75	2.75
1	11	11	11	12 16	10, 12	2.00	3.00
1 ⅛	11	11				2.00	3.00
1 ¼	10	10	10	12, 16, 27	12, 20, 27	2.00	3.00
1 ⅝	10	10				2.00	3.00
1 ⅞	10	10	10	12	12	2.25	3.25
2	10	10				2.25	3.25
2 ⅛	9	9	9	12, 14, 18, 27	10, 12, 27	2.25	3.25
2 ¼	9	9				2.25	3.25
2 ⅝	9	9	9	12	12	2.50	3.50
2 ⅞	9	9				2.50	3.50
3	8	8	8	12, 14, 27	12, 27	2.50	3.50
* 1 ⅓	8	8				2.50	3.50
1 ⅔	8	8			12	2.75	3.75
1 ⅞	7	7	7	12	8, 12	2.75	3.75
2 ⅓	7	7				2.75	3.75
2 ½	7	7				3.00	4.00
2 ⅞	7	7	7	12	12	3.00	4.00
* 3 ⅓	7	7				3.00	4.00
3 ½	7	7					4.25
3 ⅞	6	6	6	12			4.25
4	6	6					4.25
4 ⅛	6	6					4.50
4 ¼	6	6	6	12			4.50
4 ⅝	6	6					4.50

* For best results, No. 6 dies should not be used to cut larger than 1", nor No. 7 larger than 1¼", excepting in the fine pitches.



Adjustable Round Dies



All orders will be filled with U. S. Standard thread, unless otherwise specified.

Threads furnished as per Hand Tap list, pages 13 to 15.

All sizes and threads not listed are special, and subject to special prices.

Dies with Left-Hand threads are special.

Size	Diameters					
	$1\frac{7}{16}''$	$1\frac{1}{2}''$	$1\frac{9}{16}''$	$1\frac{3}{4}''$	$2\frac{1}{8}''$	$2\frac{1}{4}''$
$\frac{1}{4}$	\$1.00	\$1.00	\$1.25	\$1.25	\$1.50	\$1.50
$\frac{5}{16}$	1.00	1.00	1.25	1.25	1.50	1.50
$\frac{3}{8}$	1.00	1.00	1.25	1.25	1.50	1.50
$\frac{7}{16}$	1.00	1.00	1.25	1.25	1.50	1.50
$\frac{1}{2}$	1.00	1.00	1.25	1.25	1.50	1.50
$\frac{9}{16}$			1.25	1.50	1.75	1.75
$\frac{5}{8}$			1.25	1.50	1.75	1.75
$\frac{11}{16}$				1.75	2.00	2.00
$\frac{3}{4}$				1.75	2.00	2.00
$\frac{13}{16}$					2.25	2.25
$\frac{7}{8}$					2.25	2.25
$\frac{15}{16}$					2.50	2.50
1					2.50	2.50

* For best results we advise against the use of sizes larger than those above the horizontal lines, excepting for fine pitches.



Solid Die Stocks

For Round Solid and Round Adjustable Dies



Number	Number of Dies	Outside Diameter of Dies	Length of Stock	Price Each
1	1	$\frac{5}{8}$	5	\$.45
2	2	$1\frac{1}{4}$	7	.45
3	3	1	10	1.00
$3\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{8}$	12	1.25
4	4	$1\frac{1}{2}$	14	1.50
5	5	2	22	1.75
6	6	$2\frac{1}{2}$	30	2.00

No. 4 and larger sizes have steel tubing handles.

Adjustable Round Dies for Pipe

Right or Left Hand ; Straight or Taper Threads

Right-Hand Briggs Standard Taper sent, unless otherwise specified.

Size Pipe	Diameter Dies									
	1" ^s	$1\frac{5}{16}$ " ^s	$1\frac{1}{2}$ " ^s	$1\frac{3}{4}$ " ^s	2" ^s	$2\frac{1}{4}$ " ^s	$2\frac{1}{2}$ " ^s	3" ^s	$3\frac{1}{2}$ " ^s	4" ^s
$\frac{1}{8}$	\$.75	\$1.00	\$1.00	\$1.25	\$1.25	\$1.50				
$\frac{1}{4}$		1.00	1.00	1.25	1.25	1.50	\$1.50			
$\frac{3}{8}$			1.25	1.50	1.50	1.75	1.75	\$2.50		
$\frac{1}{2}$					1.75	2.00	2.25	3.00		
$\frac{3}{4}$						2.25	2.50	3.25		
1								3.75	\$4.50	\$5.50
$1\frac{1}{4}$									5.00	6.00
$1\frac{1}{2}$										6.50



Solid Square Bolt Dies



All orders filled with U. S. Standard threads, unless otherwise specified.

We also furnish dies $\frac{1}{32}$ and $\frac{1}{16}$ " oversize for rough iron. These take the list of the standard size, and our regular discount.

All sizes and threads not listed are special, and subject to special prices.

Left-Hand dies are special.

Size	Standard Number of Threads			V Threads also Furnished	Size of Square	Thickness	Price Each
	U. S. S.	V	Whit.				
$\frac{1}{4}$	20	20	20		$2\frac{1}{2}$	$\frac{1}{2}$	\$1.80
$\frac{3}{16}$	18	18	18	16	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{1}{2}$	16	16	16	14	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{3}{4}$	14	14	14	12	$2\frac{1}{2}$	$\frac{1}{2}$	1.80
$\frac{1}{2}$	*13	12	12	13	$2\frac{1}{2}$	$\frac{3}{4}$	1.80
$\frac{3}{4}$	12	12	12		$2\frac{1}{2}$	$\frac{3}{4}$	1.90
$\frac{1}{2}$	11	11	11	10, 12	$2\frac{1}{2}$	$\frac{3}{4}$	2.00

* Also furnished with 12 threads, U. S. S., when desired.



Solid Square Bolt Dies

(Concluded)

Size	Standard Number of Threads			V Threads also Furnished	Size of Square	Thickness	Price Each
	U. S. S.	V	Whit.				
$\frac{1}{16}$	11	11	11	12	$2\frac{1}{2}$	$\frac{3}{4}$	\$2.10
$\frac{3}{16}$	10	10	10	12	$2\frac{1}{2}$	$\frac{3}{4}$	2.20
$\frac{1}{8}$	10	10	10	12	$2\frac{1}{2}$	$\frac{3}{4}$	2.30
$\frac{7}{16}$	9	9	9	10, 12	$2\frac{1}{2}$	$\frac{3}{4}$	2.40
$\frac{1}{2}$	9	9	9	12	$2\frac{1}{2}$	$\frac{3}{4}$	2.55
1	8	8	8	12	$2\frac{1}{2}$	1	2.70
$1\frac{1}{16}$	8	8		12	$2\frac{1}{2}$	1	2.85
$1\frac{1}{8}$	7	7	7	12	$2\frac{1}{2}$	1	3.00
$1\frac{3}{16}$	7	7		12	$2\frac{1}{2}$	1	3.15
$1\frac{1}{4}$	7	7	7	12	$2\frac{1}{2}$	1	3.30
$1\frac{5}{16}$	7	7			$2\frac{1}{2}$	1	3.45
$1\frac{3}{8}$	6	6	6		$2\frac{1}{2}$	1	3.60
$1\frac{7}{16}$	6	6			$2\frac{1}{2}$	1	3.75
$1\frac{1}{2}$	6	6	6		3	1	3.90
$1\frac{5}{8}$	$5\frac{1}{2}$	5	5		3	1	4.20
$1\frac{3}{4}$	5	5	5		3	$1\frac{1}{4}$	5.40
$1\frac{7}{8}$	5	$4\frac{1}{2}$	$4\frac{1}{2}$		$3\frac{1}{2}$	$1\frac{1}{2}$	6.50
2	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$		$3\frac{3}{4}$	2	7.50



Solid Square Pipe Dies



Dies furnished with either Right or Left-Hand thread.

Size	Dimensions of Dies	Price
$\frac{1}{8}$ to $\frac{1}{2}$	2 x 2 x $\frac{1}{2}$	\$1.50
$\frac{3}{4}$ to 1	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{4}$	2.00
$\frac{3}{4}$ to $1\frac{1}{2}$	3 x 3 x $\frac{3}{4}$	2.50
$1\frac{1}{4}$ to 2	4 x 4 x $\frac{7}{8}$	3.50
$2\frac{1}{2}$ to 3	5 x 5 x $1\frac{1}{4}$	9.00

See Round Dies for Pipe, page 49.

See Spring Dies for Pipe, page 53.



Spring Screw Threading Dies for Pipe



We consider that this is the best style of die for machine use for threading the smaller sizes of steel pipe, because the cutting edges can be made with the amount of rake necessary to produce good work, and will give much less trouble on account of threads breaking out of the die than is given by other styles of dies when made with so sharp a cutting angle.

Dies to cut Right-Hand Briggs Standard taper threads sent unless otherwise ordered, but dies to cut Left-Hand and Straight threads will be furnished at the same prices.

Clamp collars are sent only when order so specifies.

Size Pipe	Diam. Die, Inches	Length Die Inches	Price Each	Price of Clamp Collar
$\frac{1}{8}, \frac{1}{4}$	1	2	\$2.00	\$.70
$\frac{1}{8}, \frac{1}{4}, \frac{3}{8}$	$1\frac{1}{4}$	$2\frac{1}{2}$	2.00	.80
$\frac{1}{4}, \frac{3}{8}$	$1\frac{3}{8}$	$2\frac{1}{2}$	2.40	1.00
$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$	$1\frac{3}{8}$	$2\frac{3}{4}$	2.75	1.00
$\frac{1}{2}, \frac{3}{4}$	2	3	3.50	1.25
$\frac{3}{4}, 1$	$2\frac{1}{2}$	$3\frac{1}{2}$	5.00	2.00
1, $1\frac{1}{4}, 1\frac{1}{2}$	$3\frac{1}{4}$	4	8.00	3.00

For Brass, we supply these dies with radial cutting edges.

All of our Spring Dies for Taper Pipe threads are relieved in the thread. This is a great help to good work, but is not generally done.



Spring Screw Threading Dies

Machine Screw Sizes



We believe that this is the best style of die for machine use.

They are easily adjusted and sharpened, and will average to cut threads better in form, lead and finish, than any other kind of die.

Clamp collars are not furnished with dies unless ordered.

Left-Hand dies are special.

When dies are for use on brass exclusively, orders should so specify.

Size of Screw Gauge	Standard No. of Threads Per Inch	A. S. M. E. Standard Threads	Diameter of Die, Inches	Length of Die, Inches	Price Each	Price of Clamp Collar
2	56	64	$\frac{1}{2}$	$1\frac{1}{4}$	\$1.50	\$.50
3	48	56	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
4	36	48	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
5	36	44	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
6	32	40	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
8	32	36	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
10	24	30	$\frac{1}{2}$	$1\frac{1}{4}$	1.50	.50
8	32	36	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	.60
10	24	30	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	.60
12	24	28	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	.60
14	20	24	$\frac{3}{4}$	$1\frac{3}{4}$	1.75	.60

Other threads furnished as in machine screw tap list, on page 21.

Spring Screw Threading Dies

U. S. Standard threads sent unless otherwise ordered.

All sizes and threads in Hand Tap list, pages 13 to 15, are furnished at regular prices.

Cutting Size	Standard Number of Threads per Inch			Outside Diam. of Die, Inches	Length of Die, Inches	Price Each	
	U. S. S.	V	Whit.			Die	Clamp Collar
$\frac{1}{8}$	40		40	$\frac{1}{2}$	1 $\frac{1}{4}$	\$1.50	\$.50
$\frac{1}{16}$	32	24	24	$\frac{1}{2}$	1 $\frac{1}{4}$	1.50	.50
$\frac{1}{4}$	20	20	20	$\frac{1}{2}$	1 $\frac{1}{4}$	1.50	.50
$\frac{3}{8}$	20	20	20	$\frac{3}{4}$	1 $\frac{1}{4}$	1.75	.60
$\frac{1}{2}$	18	18	18	$\frac{3}{4}$	1 $\frac{1}{4}$	1.75	.60
$\frac{3}{4}$	16	16	16	$\frac{3}{4}$	1 $\frac{1}{4}$	1.75	.60
$\frac{1}{2}$	16	16	16	1	2	2.00	.70
$\frac{3}{4}$	14	14	14	1	2	2.00	.70
$\frac{1}{2}$	13	12	12	1	2	2.00	.70
$\frac{3}{8}$	11	11	11	1 $\frac{1}{8}$	2 $\frac{1}{4}$	2.00	.80
$\frac{1}{2}$	11	11	11	1 $\frac{1}{8}$	2 $\frac{1}{4}$	2.00	.80
$\frac{3}{4}$	10	10	10	1 $\frac{1}{8}$	2 $\frac{1}{4}$	2.00	.80
$\frac{1}{2}$	16	16	16	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{3}{4}$	14	14	14	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{1}{2}$	13	12	12	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{3}{8}$	12	12	12	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{1}{2}$	11	11	11	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{3}{4}$	10	10	10	1 $\frac{1}{4}$	2 $\frac{1}{2}$	2.00	.80
$\frac{1}{2}$	13	12	12	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.40	1.00
$\frac{3}{8}$	12	12	12	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.40	1.00
$\frac{1}{2}$	11	11	11	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.40	1.00
$\frac{3}{4}$	10	10	10	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.40	1.00
$\frac{1}{2}$	11	11	11	1 $\frac{3}{8}$	2 $\frac{3}{4}$	2.75	1.00
$\frac{3}{4}$	10	10	10	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.75	1.00
$\frac{1}{2}$	10	10	10	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.75	1.00
$\frac{1}{2}$	9	9	9	1 $\frac{3}{8}$	2 $\frac{3}{4}$	2.75	1.00
*1	8	8	8	1 $\frac{3}{8}$	2 $\frac{1}{2}$	2.75	1.00
$\frac{3}{4}$	10	10	10	2	3	3.50	1.25
$\frac{1}{2}$	9	9	9	2	3	3.50	1.25
$\frac{1}{2}$	9	9	9	2	3	3.50	1.25
1	8	8	8	2	3	3.50	1.25
$\frac{1}{2}$	7	7	7	2	3	3.50	1.25
*1 $\frac{1}{4}$	7	7	7	2	3	3.50	1.25
1	8	8	8	2 $\frac{1}{2}$	3 $\frac{1}{2}$	5.00	2.00
$\frac{1}{2}$	7	7	7	2 $\frac{1}{2}$	3 $\frac{1}{2}$	5.00	2.00
$\frac{1}{4}$	7	7	7	2 $\frac{1}{2}$	3 $\frac{1}{2}$	5.00	2.00
$\frac{1}{2}$	6	6	6	2 $\frac{1}{2}$	3 $\frac{1}{2}$	5.00	2.00
$\frac{1}{2}$	6	6	6	2 $\frac{1}{2}$	3 $\frac{1}{2}$	5.00	2.00
$\frac{1}{2}$	5 $\frac{1}{2}$	5	5	3 $\frac{1}{4}$	4	8.00	3.00
$\frac{1}{2}$	5	5	5	3 $\frac{1}{4}$	4	8.00	3.00
$\frac{1}{2}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{4}$	4	8.00	3.00
2	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{4}$	4	8.00	3.00

* These sizes are too large for outside diameter given, excepting for fine threads.

Machinists' Hand Taps

S. A. E. Standard (formerly A. L. A. M. Standard)



Taper



Plug



Bottoming

These taps are made to conform to the standard adopted by a great majority of the automobile manufacturers.

The thread form is U. S. Standard, but the pitches are finer, to meet the requirements of automobile construction.

Nut, Tapper, Beaman & Smith, and Hob taps made to the S. A. E. Standard are regular, and listed on pages 16, 22, 29, 26 and 27, respectively.

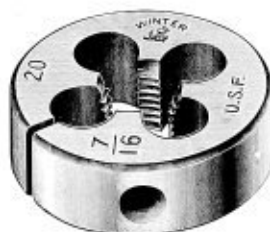
Taps with Left-Hand threads are special.

Diameter	Number of Threads per Inch	Total Length, Inches	Price Each	Price per Set
$\frac{1}{4}$	28	$2\frac{1}{2}$	\$.45	\$1.35
$\frac{5}{16}$	24	$2\frac{1}{4}$	.50	1.50
$\frac{3}{8}$	24	$2\frac{1}{4}$	.55	1.65
$\frac{7}{16}$	20	$3\frac{5}{8}$	.60	1.80
$\frac{1}{2}$	20	$3\frac{3}{8}$	.70	2.10
$\frac{9}{16}$	18	$3\frac{1}{2}$	.80	2.40
$\frac{5}{8}$	18	$3\frac{1}{2}$	.90	2.70
$\frac{11}{16}$	16	$4\frac{1}{4}$	1.05	3.15
$\frac{3}{4}$	16	$4\frac{1}{4}$	1.20	3.60
$\frac{7}{8}$	14, 18	$4\frac{1}{2}$	1.60	4.80
1	14	$5\frac{1}{8}$	2.00	6.00
$1\frac{1}{8}$	12	$5\frac{1}{8}$	2.25	6.75
$1\frac{1}{4}$	12	$5\frac{3}{4}$	2.60	7.80
$1\frac{3}{8}$	12	$6\frac{1}{4}$	3.00	9.00
$1\frac{1}{2}$	12	$6\frac{3}{8}$	3.50	10.50



Round Adjustable Dies

S. A. E. Standard



Dies are regularly supplied with our screw adjustment, but are also furnished without the screw and slotted for set screw points, so that they can be adjusted by screws in the die holder.

Dies with Left-Hand threads are special.

Cut- ting Size	Thds. per Inch	Diameter of Dies										
		$1\frac{1}{16}''$	$1''$	$1\frac{5}{16}''$	$1\frac{7}{16}''$	$1\frac{1}{2}''$	$1\frac{9}{16}''$	$1\frac{3}{4}''$	$2''$	$2\frac{1}{4}''$	$2\frac{1}{2}''$	$3''$
$\frac{1}{4}$	28	\$.40	\$.75	\$1.00	\$1.00	\$1.00	\$1.25	\$1.25	\$1.25	\$1.50	\$1.50	
$\frac{3}{16}$	24		.75	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	
$\frac{3}{8}$	24		.75	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	
$\frac{7}{16}$	20			1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	
$\frac{1}{2}$	20			1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	\$2.50
$\frac{9}{16}$	18					1.15	1.25	1.50	1.50	1.75	1.75	2.75
$\frac{5}{8}$	18					1.25	1.25	1.50	1.50	1.75	1.75	2.75
$\frac{11}{16}$	16							1.75	1.75	2.00	2.00	3.00
$\frac{3}{4}$	16							1.75	1.75	2.00	2.00	3.00
$\frac{7}{8}$	14, 18									2.25	2.25	3.25
1	14									2.50	2.50	3.50
$1\frac{1}{8}$	12										2.75	3.75
$1\frac{1}{4}$	12										3.00	4.00
$1\frac{3}{8}$	12											4.25
$1\frac{1}{2}$	12											4.50

Memoranda

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High-Speed Steel Taps and Dies

of which we are the first successful makers

For twelve years we have been manufacturing, for some of the largest and many of the most particular consumers, a constantly increasing quantity of carbon steel taps and dies of the highest grade. Our constant direct contact with those who have demanded the very best of material and the greatest accuracy in workmanship, has given us a very broad experience in this particular line.

It must be evident that, in the light of this experience, we would not think of recommending the use of High-Speed steel taps and dies without abundant proof of their value.

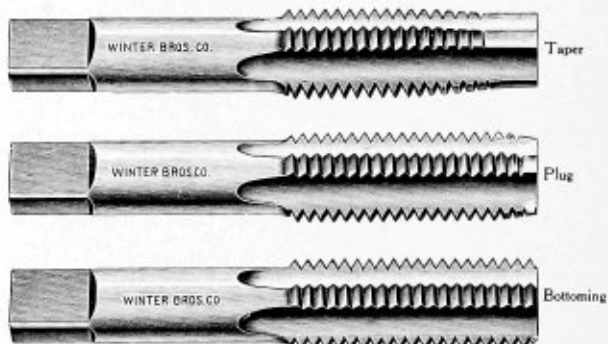
In 1907 we started to introduce them into a few places where we could get definite information as to the results obtained. It was at once evident that under most conditions great gains could be made, either in the life of the tools or in the speed of operation, or both, and that these gains much more than compensated for the increased first cost.

In the face of strong prejudice against their use we have successfully introduced them in many places during the last two years, until they are now a very important part of our product.

The prices of High-Speed steel taps and dies of regularly listed sizes average from three to four times those of carbon steel. We have many records of production increased by their use from five to fifteen times.



High-Speed Steel Machinists' Hand Taps



All orders will be filled with plug taps with U. S. S. thread unless otherwise specified.

All hand taps up to and including $\frac{1}{4}$ " diameter have shanks the full size of threads. Taps $\frac{3}{8}$ " diameter and larger have shanks below the root of the threads.

S. A. E. (formerly A. L. A. M.) standard taps, which have U. S. F. threads, are included in this list.

All sizes, lengths and threads not listed are special, and subject to special prices. See list prices for taps of special lengths, pages 68 and 69, and information in regard to special taps, pages 67 and 70.

All Left-Hand taps are special.

High-Speed Steel Machinists' Hand Taps



Diameter	Standard Number of Threads		V Threads also Furnished	U. S. F. Threads also Furnished	Price each	Total Length, Inches
	V	U. S. S.				
$\frac{3}{16}$	24	32	32	24	\$.50	$2\frac{1}{8}$
$\frac{7}{32}$	24	28			.60	$2\frac{1}{8}$
$\frac{1}{4}$	20	20	24	24, 27, 28	.65	$2\frac{1}{2}$
$\frac{5}{16}$	18	18		24, 27	.75	$2\frac{3}{4}$
$\frac{3}{8}$	16	16		24, 27	.85	$2\frac{5}{8}$
$\frac{7}{16}$	14	14		20, 27	1.00	$3\frac{1}{8}$
$\frac{1}{2}$	12	13	13	12, 20, 27	1.20	$3\frac{1}{2}$
$\frac{9}{16}$	12	12		18, 27	1.50	$3\frac{3}{4}$
$\frac{5}{8}$	11	11		12, 18, 27	1.85	$3\frac{5}{8}$
$\frac{11}{16}$	11	11		12, 16	2.10	4
$\frac{3}{4}$	10	10		12, 16, 27	2.40	$4\frac{1}{4}$
$\frac{13}{16}$	10	10		12	2.75	$4\frac{7}{8}$
$\frac{7}{8}$	9	9		12, 14, 18, 27	3.20	$4\frac{5}{8}$
$\frac{15}{16}$	9	9		12	3.70	$4\frac{3}{4}$
1	8	8		12, 14, 27	4.20	$5\frac{1}{4}$
$1\frac{1}{8}$	7	7		12	5.10	$5\frac{7}{8}$
$1\frac{1}{4}$	7	7		12	6.20	$5\frac{3}{4}$
$1\frac{3}{8}$	6	6			7.30	$6\frac{1}{8}$
$1\frac{1}{2}$	6	6			8.75	$6\frac{1}{4}$
$1\frac{5}{8}$	5	$5\frac{1}{2}$			10.60	$6\frac{5}{8}$
$1\frac{3}{4}$	5	5			12.60	7
$1\frac{7}{8}$	$4\frac{1}{2}$	5			14.60	$7\frac{5}{8}$
2	$4\frac{1}{2}$	$4\frac{1}{2}$			17.00	$7\frac{1}{2}$

Larger taps of all kinds made to order, the larger sizes being made with machinery steel bodies and inserted renewable blades of High-Speed steel; also short shell taps of High-Speed steel which can be fitted to shanks.—See pages 67 and 70.



High-Speed Steel Nut Taps

All orders filled with U. S. S. threads unless otherwise specified.

Left-Hand threads are special.



Diameter	Standard Number of Threads		U. S. F. Threads also Furnished	Price Each	Length of Thread, Inches
	V	U. S. S.			
$\frac{3}{16}$	24	32	24	\$.80	$4\frac{1}{2}$
$\frac{1}{4}$	24	28		.85	$4\frac{1}{2}$
$\frac{5}{16}$	20	20	24, 28	.90	5
$\frac{3}{8}$	18	18	20, 24	1.05	$5\frac{1}{2}$
$\frac{7}{16}$	16	16	20, 24	1.15	6
$\frac{1}{2}$	14	14	20	1.50	$6\frac{1}{2}$
$\frac{9}{16}$	12	13	12, 20	1.80	7
$\frac{5}{8}$	12	12	18	2.30	$7\frac{1}{2}$
$\frac{3}{4}$	11	11	12, 18	2.85	8
$\frac{7}{8}$	11	11	12, 16	3.50	$8\frac{1}{2}$
$1\frac{1}{8}$	10	10	12, 16	3.90	9
$1\frac{1}{4}$	10	10	12	4.70	$9\frac{1}{2}$
$1\frac{3}{8}$	9	9	12, 14	5.30	10
$1\frac{1}{2}$	9	9	12	6.40	$10\frac{1}{2}$
$1\frac{3}{4}$	8	8	12, 14	7.10	11
$1\frac{7}{8}$	7	7	12	8.85	$11\frac{1}{2}$
2	7	7	12	10.30	12
$2\frac{1}{8}$	6	6		12.90	$12\frac{1}{2}$
$2\frac{1}{4}$	6	6		15.35	13
$2\frac{3}{8}$	5	$5\frac{1}{2}$		19.05	$13\frac{1}{2}$
$2\frac{1}{2}$	5	5		22.05	14
$2\frac{7}{8}$	$4\frac{1}{2}$	5		26.70	$14\frac{1}{2}$
3	$4\frac{1}{2}$	$4\frac{1}{2}$		30.00	15

On account of the amount of expensive steel required, and the fact that High-Speed steel shows greater efficiency when taking heavier cuts than those taken by the top of each thread on the long taper of nut and taper taps, these two styles do not show such great gains in proportion to their cost as other styles.



High-Speed Steel Tapper Taps

All orders filled with U. S. S. threads unless otherwise specified.

Left-Hand taps are special.

Diameter	Number of Threads per inch			Price Each Lengths			
	V	U. S. S.	U.S.P.	11 Inch.	12 Inch.	14 Inch.	15 Inch.
$\frac{1}{4}$	20	20	28	\$1.05	\$1.10	\$1.20	\$1.25
$\frac{5}{16}$	18	18	24	1.35	1.40	1.50	1.55
$\frac{3}{8}$	16	16	24	1.65	1.75	1.95	2.00
$\frac{7}{16}$	14	14	20	2.05	2.15	2.40	2.50
$\frac{1}{2}$	12	13	20	2.40	2.55	2.90	3.10
$\frac{9}{16}$	12	12	18	2.90	3.10	3.50	3.70
$\frac{5}{8}$	11	11	18	3.55	3.75	4.15	4.35
$\frac{11}{16}$	11	11	16	4.00	4.25	4.75	5.00
$\frac{3}{4}$	10	10	16	4.50	4.80	5.40	5.70
$\frac{13}{16}$	10	10		5.05	5.40	6.10	6.45
$\frac{7}{8}$	9	9	14	5.70	6.10	6.90	7.25
$\frac{15}{16}$	9	9		6.40	6.85	7.70	8.10
1	8	8	14	7.10	7.60	8.60	9.10
$1\frac{1}{8}$	7	7		8.30	8.85	9.95	10.50
$1\frac{1}{4}$	7	7		9.65	10.30	11.60	12.25
$1\frac{3}{8}$	6	6		11.30	12.10	13.70	14.50
$1\frac{1}{2}$	6	6		13.45	14.40	16.30	17.25
$1\frac{5}{8}$	5	$5\frac{1}{2}$		15.55	16.70	19.05	20.25
$1\frac{3}{4}$	5	5		18.00	19.35	22.05	23.40
$1\frac{7}{8}$	$4\frac{1}{2}$	5		20.35	21.90	25.10	26.70
2	$4\frac{1}{2}$	$4\frac{1}{2}$		22.90	24.70	28.30	30.00

See note on the question of efficiency, at bottom of opposite page.



High-Speed Steel Machine Screw Taps

When we started to manufacture High-Speed taps we did not expect to do much with sizes under $\frac{3}{8}$ " diameter, thinking that the loss on account of breakage would not give a chance to take advantage of the long-wearing quality of High-Speed steel. While this may be true in a few cases, we have learned that many of our best opportunities to show large returns are with machine screw taps.

High-Speed steel drill rod, when properly hardened and tempered, averages stronger than carbon steel, so in all cases where there has been but little trouble from breakage, the use of High-Speed taps should be considered.

In both our carbon steel and our High-Speed lines we have adopted, in addition to the recognized standard form, two other styles which have been proved by many trials to be particularly adapted to certain classes of work. The commonly used form is most suitable for hand use, and for most kinds of cast iron work.

For Tapping Brass in machines, use our High-Speed Machine Screw taps made especially for this purpose.

For Tapping Steel, or other tough metals, use our special form taps designed for this work.

Do not drill small holes and try to tap a full thread. It rarely happens that over 75% of the full thread depth is required, and usually less answers all purposes, and saves much trouble in tapping.

Do not expect the best results in tapping steel unless you use plenty of lard, cotton-seed or sperm oil.

High-Speed Machine Screw Taps not listed are made to order at special prices. We will quote you special discounts, increasing with the quantities ordered, — 25 dozen or more taps of a size taking the full discount of regular taps.

High-Speed Steel Machine Screw Taps



All sizes and threads not listed are special, and subject to special prices.

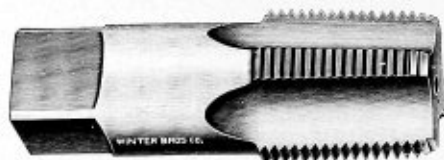
Left-Hand machine screw taps are special.

Read page 64 in regard to different styles for special purposes.

Screw Gauge No.	Price Each	Per Doz.	Threads		A. S. M. E.	
			Std.	Also Furnished	Std.	Also Furnished
2	8 .50	86.00	56		64	56
3	.50	6.00	48		56	48
4	.50	6.00	36	40	48	36, 40
5	.50	6.00	36	40	44	36, 40
6	.50	6.00	32	30, 36	40	32, 36
7	.50	6.00	32		36	30, 32
8	.50	6.00	32	30, 36	36	30, 32
9	.50	6.00	30	32	32	24, 30
10	.50	6.00	24	30, 32, 36	30	24, 32
11	.50	6.00	24			
12	.50	6.00	24	32	28	24
13	.65	7.75	22	24		
14	.65	7.75	20	24	24	20
15	.65	7.75	20	24		
16	.65	7.75	18	16, 20	22	20
18	.65	7.75	18	16, 20	20	18
20	.80	9.50	16	18	20	18
22	.80	9.50	16	18	18	16
24	.80	9.50	16	18	16	18
26	.95	11.30	16	14	16	14
28	.95	11.30	14	16	14	16
30	.95	11.30	14	16	14	16



High-Speed Steel Pipe Taps

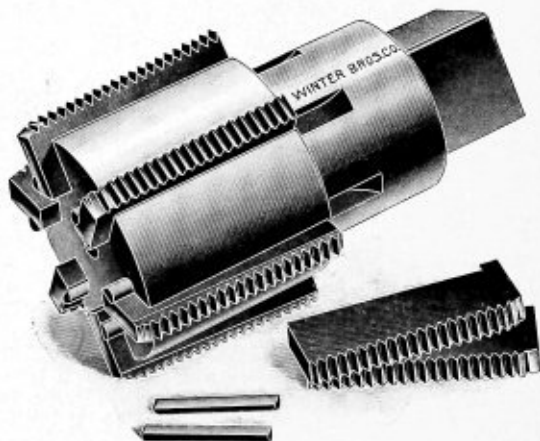


Size	Price	Size	Price	With Inserted Chasers	
				Size	Price
$\frac{1}{8}$	8.00	1	85.25	2	811.00
$\frac{1}{4}$	1.30	$1\frac{1}{4}$	8.00	$2\frac{1}{2}$	11.50
$\frac{3}{8}$	1.75	$1\frac{1}{2}$	10.00	3	12.75
$\frac{1}{2}$	2.50	2	15.00	$3\frac{1}{2}$	14.50
$\frac{3}{4}$	3.50	—	—	4	17.50

Extra chasers for inserted chaser pipe taps, \$6.50 per set of six.

Larger pipe taps, with inserted chasers, up to 12", made to order at very reasonable prices.

Right-Hand taper pipe taps always sent unless otherwise specified, but left-hand and straight taps are regular.



See note on "Inserted Chaser Taps" on opposite page.



High-Speed Steel Taps for Beaman & Smith Holders



Fitting No. 1 Holder				Fitting No. 2 Holder			
Diam-eter	Threads		Price	Diam-eter	Threads		Price
	V	U. S. S.			V	U. S. S.	
$\frac{1}{4}$	20	20, 28	8 .90	$\frac{3}{8}$	11	11, 18	82.40
$\frac{5}{16}$	18	18, 24	.95	$\frac{11}{16}$	11	11, 16	2.50
$\frac{3}{8}$	16	16, 24	1.00	$\frac{3}{4}$	10	10, 16	2.60
$\frac{7}{16}$	14	14, 20	1.25	$\frac{13}{16}$	10	10	2.95
$\frac{1}{2}$	12, 13	12, 13, 20	1.35	$\frac{7}{8}$	9	9, 14	3.30
$\frac{9}{16}$	12	12, 18	1.60	1	8	8, 14	4.50
$\frac{5}{8}$	11	11, 18	1.85	$1\frac{1}{8}$	7	7	5.50
				$1\frac{1}{4}$	7	7	6.50

U. S. S. threads sent unless otherwise specified.
Left-Hand taps are special.

Inserted Chaser Taps

Taps similar to the inserted chaser pipe tap shown on the opposite page, give the opportunity for great economy and efficiency in all large sizes.

The cost of new sets of High-Speed steel chasers is less than that of a carbon steel tap, of about 2" diameter; and on sizes as large as 4" diameter the cost of a complete inserted chaser tap is less than that of a carbon steel tap, while new sets of chasers of High-Speed steel cost only about one third as much as a solid carbon steel tap. We make these taps to order to meet all requirements.



Special Taps of High-Speed Steel

Special taps with V, U. S. S. or Whitworth threads, (with the exception of shell taps and inserted chaser taps), of lengths and diameters differing from the regular lists, take the list prices as found below, using list applying to the length over all, and the largest diameter of the tap whether on shank or thread.

Diam.	2"	3"	4"	5"	6"	7"	8"
$\frac{3}{16}$	\$.50	\$.55	\$.60	\$.65	\$.70	\$.75	\$.80
$\frac{1}{4}$	.60	.65	.70	.75	.80	.85	.90
$\frac{5}{16}$	.70	.75	.85	.95	1.05	1.15	1.20
$\frac{3}{8}$	.80	.85	.95	1.05	1.15	1.25	1.35
$\frac{7}{16}$	.90	1.00	1.15	1.25	1.40	1.50	1.65
$\frac{1}{2}$	1.05	1.20	1.35	1.50	1.65	1.80	1.95
$\frac{9}{16}$	1.20	1.35	1.50	1.70	1.90	2.10	2.30
$\frac{5}{8}$	1.35	1.60	1.85	2.10	2.35	2.60	2.85
$\frac{11}{16}$	1.50	1.80	2.10	2.40	2.70	3.00	3.25
$\frac{3}{4}$	1.70	2.05	2.40	2.70	3.00	3.30	3.60
$\frac{7}{8}$	1.90	2.25	2.60	2.95	3.30	3.65	4.00
$\frac{15}{16}$	2.10	2.50	2.90	3.30	3.70	4.10	4.50
1	2.35	2.80	3.25	3.70	4.15	4.60	5.05
$1\frac{1}{16}$	2.60	3.10	3.60	4.10	4.60	5.10	5.60
$1\frac{1}{8}$	3.10	3.70	4.30	4.90	5.50	6.10	6.65
$1\frac{1}{4}$	3.60	4.30	5.00	5.70	6.40	7.05	7.70
$1\frac{1}{2}$	4.10	4.90	5.70	6.50	7.30	8.10	8.90
$1\frac{3}{4}$	4.60	5.60	6.60	7.60	8.60	9.60	10.60
$1\frac{7}{8}$	5.20	6.35	7.50	8.65	9.80	10.95	12.10
$1\frac{15}{16}$	5.80	7.20	8.55	9.90	11.25	12.60	13.95
$1\frac{1}{2}$	6.40	7.95	9.50	11.05	12.60	14.15	15.70
2	7.00	8.60	10.30	12.10	13.90	15.70	17.50
$2\frac{1}{16}$		9.40	11.40	13.40	15.40	17.35	19.30
$2\frac{1}{8}$		10.40	12.60	14.75	16.90	19.05	21.20
$2\frac{1}{4}$		11.50	13.90	16.25	18.60	20.95	23.30
$2\frac{1}{2}$		12.70	15.30	17.90	20.50	23.10	25.70
$2\frac{3}{8}$		14.00	16.85	19.70	22.55	25.40	28.25
$2\frac{1}{2}$		15.45	18.55	21.65	24.75	27.85	30.95
$2\frac{7}{8}$		17.00	20.40	23.80	27.20	30.60	34.00
3		18.75	22.45	26.15	29.85	33.55	37.25

Special Taps of High-Speed Steel



Taps more than $\frac{1}{32}$ " larger diameter than listed sizes take price of the next larger size.

Taps $\frac{1}{2}$ " longer than listed lengths take price of next longer size.

Taps with threads of other than V, U. S. S. or Whitworth form at advanced prices.

Discounts depend on the quantities ordered at one time.

Diam.	9"	10"	11"	12"	13"	14"	15"
$\frac{5}{16}$	\$.85	\$.90	\$.95	\$1.00	\$1.05	\$1.10	\$1.15
$\frac{1}{4}$	.95	1.00	1.05	1.10	1.15	1.20	1.25
$\frac{5}{16}$	1.25	1.30	1.35	1.40	1.45	1.50	1.55
$\frac{3}{8}$	1.45	1.55	1.65	1.75	1.85	1.95	2.00
$\frac{7}{16}$	1.75	1.90	2.05	2.15	2.30	2.40	2.50
$\frac{1}{2}$	2.10	2.25	2.40	2.55	2.75	2.90	3.10
$\frac{9}{16}$	2.50	2.70	2.90	3.10	3.30	3.50	3.70
$\frac{5}{8}$	3.10	3.35	3.55	3.75	3.95	4.15	4.35
$\frac{11}{16}$	3.50	3.75	4.00	4.25	4.50	4.75	5.00
$\frac{3}{4}$	3.90	4.20	4.50	4.80	5.10	5.40	5.70
$\frac{13}{16}$	4.35	4.70	5.05	5.40	5.75	6.10	6.45
$\frac{7}{8}$	4.90	5.30	5.70	6.10	6.50	6.90	7.25
$\frac{15}{16}$	5.50	5.95	6.40	6.85	7.30	7.70	8.10
1	6.10	6.60	7.10	7.60	8.10	8.60	9.10
$1\frac{1}{8}$	7.20	7.75	8.30	8.85	9.40	9.95	10.50
$1\frac{1}{4}$	8.35	9.00	9.65	10.30	10.95	11.60	12.25
$1\frac{3}{8}$	9.70	10.50	11.30	12.10	12.90	13.70	14.50
$1\frac{1}{2}$	11.55	12.50	13.45	14.40	15.35	16.30	17.25
$1\frac{5}{8}$	13.25	14.40	15.55	16.70	17.85	19.05	20.25
$1\frac{3}{4}$	15.30	16.65	18.00	19.35	20.70	22.05	23.40
$1\frac{7}{8}$	17.25	18.80	20.35	21.90	23.50	25.10	26.70
2	19.30	21.10	22.90	24.70	26.50	28.30	30.00
$2\frac{1}{8}$	21.25	23.25					
$2\frac{1}{4}$	23.35	25.50					
$2\frac{3}{8}$	25.65	28.00					
$2\frac{1}{2}$	28.30	30.90					
$2\frac{3}{4}$	31.10	33.95					
$2\frac{7}{8}$	34.05	37.15					
$2\frac{15}{16}$	37.40	40.80					
3	40.95	44.65					

Consult information on:

Inserted Chaser Taps, page 67

High-Speed Shell Taps, page 70

Economical Design of Taps, page 70.

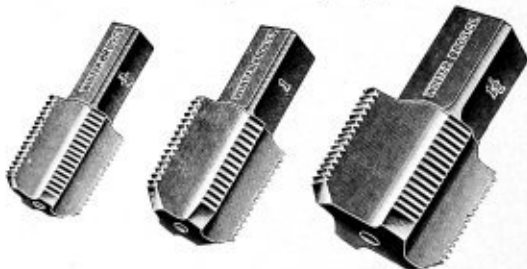


High-Speed Steel Shell Taps



On account of the comparatively small amount of steel required, shell taps are frequently the cheapest style to use for special work. There are many cases, especially in fine thread work, where the length need not be over one inch for taps as large as six inches in diameter. Shell taps are made to order only.

Economical Design of High-Speed Taps



To effect the greatest economy in the use of High-Speed Steel taps they should be made as short as the operating conditions will allow. Designs that call for shanks of larger diameter than the thread should be avoided, as the price of the tap is determined by the largest diameter.

High-Speed Steel Spring Screw Threading Dies



While dies of this style cost more than others, they offer numerous advantages. They are very easily adjusted. They can be readily ground, when dull. They give ample room for chips and for lubrication. They will average to produce better work in lead, thread form and finish than any other style of dies.

In some cases, where fine threads are used, dies may be made to cut larger sizes than we have listed for each outside diameter, but we advise that it is important to have dies heavy enough so that the sections will not twist under cutting strains.

All sizes and threads in Hand Tap and Machine Screw Tap lists, pages 61 and 65 respectively, furnished at regular prices.

Cutting Sizes	Diameter Die	Length Die	Price	Price of Clamp Collar
Nos. 2 to 10 inclusive	$\frac{1}{2}$	$1\frac{1}{4}$	\$2.60	\$.50
$\frac{1}{8}$ " to $\frac{7}{32}$ " "	$\frac{1}{2}$	$1\frac{1}{4}$	2.60	.50
Nos. 8 to 18 "	$\frac{3}{4}$	$1\frac{3}{4}$	3.00	.60
$\frac{1}{4}$ " to $\frac{3}{8}$ " "	$\frac{3}{4}$	$1\frac{3}{4}$	3.00	.60
$\frac{1}{4}$ " to $\frac{1}{2}$ " "	1	2	3.50	.70
$\frac{3}{8}$ " to $\frac{11}{16}$ " "	$1\frac{1}{4}$	$2\frac{1}{2}$	4.25	.80
$\frac{1}{2}$ " to $\frac{3}{4}$ " "	$1\frac{1}{2}$	$2\frac{1}{2}$	4.75	1.00
$\frac{5}{8}$ " to 1 " "	$1\frac{3}{4}$	$2\frac{1}{2}$	5.25	1.00
$\frac{3}{4}$ " to $1\frac{1}{8}$ " "	2	3	6.75	1.25
1 " to $1\frac{1}{2}$ " "	$2\frac{1}{2}$	$3\frac{1}{2}$	8.75	2.00
$1\frac{1}{2}$ " to 2 " "	$3\frac{1}{4}$	4	14.00	3.00
Pipe Sizes.				
$\frac{1}{8}$ " to $\frac{1}{4}$ " "	1	2	3.50	.70
$\frac{1}{8}$ " to $\frac{3}{8}$ " "	$1\frac{1}{4}$	$2\frac{1}{2}$	4.25	.80
$\frac{1}{4}$ " to $\frac{3}{8}$ " "	$1\frac{3}{8}$	$2\frac{1}{2}$	4.75	1.00
$\frac{1}{4}$ " to $\frac{1}{2}$ " "	$1\frac{3}{8}$	$2\frac{1}{2}$	5.25	1.00
$\frac{1}{2}$ " to $\frac{3}{4}$ " "	2	3	6.75	1.25
$\frac{3}{4}$ " to 1 " "	$2\frac{1}{2}$	$3\frac{1}{2}$	8.75	2.00
1 " to $1\frac{1}{2}$ " "	$3\frac{1}{4}$	4	14.00	3.00



High-Speed Steel Dies

One of the Best Propositions in the Small Tool Line



Thread cutting dies are ideal tools to be made of High-Speed steel. A comparatively small amount of steel is used, so the cost is not increased as much over carbon steel as in some other kinds of tools. The heavy cut which they must take on each thread in the tapered part, which is not often over three threads long, is the class of work for which this steel is particularly adapted.

For use in Automatic Machines, the long life of our High-Speed dies makes them especially desirable, since stoppages to replace, sharpen, or re-adjust, are much reduced. We have records showing gains in production running from five to fifteen times the amounts that were previously obtained with good carbon steel dies.

All orders will be filled with U. S. S. threads unless otherwise specified.

All sizes and threads listed in Hand Tap and Machine Screw Tap lists, pages 61 and 65 respectively, furnished at regular prices.

All Left-Hand dies are special.

Unless otherwise specified, High-Speed round dies will be furnished in the style shown in the above cut, to be adjusted by screws in the die holder; but dies with our regular screw adjustment will be furnished, if so ordered.

Special dies of all kinds made to order.

When Special Hobs must be made, a charge will be made for these, and they will be retained in our possession.

Read pages 4, 5, 6 and 7.



High-Speed Steel Adjustable Round Dies for Pipe



Dies to cut right-hand taper threads always sent unless otherwise ordered, but dies to cut straight threads and left-hand threads are regular.

Pipe Size	Diameter of Dies									
	1°	1 1/8°	1 1/2°	1 3/4°	2°	2 1/4°	2 1/2°	3°	3 1/2°	4°
1/8	\$1.50	\$2.00	\$2.50	\$2.75	\$3.00					
1/4		2.25	2.75	3.00	3.25	\$3.65	\$4.00			
3/8			3.15	3.50	3.75	4.00	4.50			
1/2					3.75	4.00	4.50	\$6.50		
3/4						4.50	5.00	7.00	\$9.00	
1								7.25	9.25	\$11.75
1 1/4									10.50	13.00
1 1/2										14.00

All of our High-Speed Taper Pipe Dies are relieved in the thread. This causes them to cut much easier than ordinary pipe dies, and especially in some kinds of brass and tough bronze will save the user a great deal of trouble.



Tables of Information

Different Standards for Wire Gauge in Use in the United States

Dimensions of Sizes in Decimal Parts of an Inch

No. of Wire Gauge	American or Brown & Sharpe	Birmingham or Stubs' Wire	Washburn & Moen Mfg. Co. Worcester, Mass.	Trenton Iron Co. Trenton, N. J.	Stubs' Steel Wire	U. S. Standard for Plate	No. of Wire Gauge
000000	—	—	—	—	—	.46875	000000
00000	—	—	—	.45	—	.4375	00000
0000	.46	.454	.3928	.4	—	.40625	0000
000	.40964	.425	.3625	.36	—	.375	000
00	.3648	.38	.3310	.33	—	.34375	00
0	.32486	.34	.3065	.305	—	.3125	0
1	.2893	.3	.2830	.285	.227	.28125	1
2	.25763	.284	.2625	.265	.219	.265625	2
3	.22942	.259	.2437	.245	.212	.25	3
4	.20431	.238	.2253	.225	.207	.234375	4
5	.18194	.22	.2070	.205	.204	.21875	5
6	.16202	.203	.1920	.19	.201	.203125	6
7	.14428	.18	.1770	.175	.199	.1875	7
8	.12849	.165	.1620	.16	.197	.171875	8
9	.11443	.148	.1483	.145	.194	.15625	9
10	.10189	.134	.1350	.13	.191	.140625	10
11	.090742	.12	.1205	.1175	.188	.125	11
12	.080808	.109	.1055	.105	.185	.109375	12
13	.071961	.095	.0915	.0925	.182	.09375	13
14	.064084	.083	.0800	.08	.180	.078125	14
15	.057068	.072	.0720	.07	.178	.0703125	15
16	.05082	.065	.0625	.061	.175	.0625	16
17	.045257	.058	.0540	.0525	.172	.05625	17
18	.040303	.049	.0475	.045	.168	.05	18
19	.03589	.042	.0410	.04	.164	.04375	19
20	.031961	.035	.0348	.035	.161	.0375	20
21	.028462	.032	.03175	.031	.157	.034375	21
22	.025347	.028	.0286	.028	.155	.03125	22
23	.022571	.025	.0258	.025	.153	.028125	23
24	.0201	.022	.0230	.0225	.151	.025	24
25	.0179	.02	.0204	.02	.148	.021875	25
26	.01594	.018	.0181	.018	.146	.01875	26
27	.014195	.016	.0173	.017	.143	.0171875	27
28	.012641	.014	.0162	.016	.139	.015625	28
29	.011257	.013	.0150	.015	.134	.0140625	29
30	.010025	.012	.0140	.014	.127	.0125	30
31	.008928	.01	.0132	.013	.120	.0109375	31
32	.00795	.009	.0128	.012	.115	.01015625	32
33	.00708	.008	.0118	.011	.112	.009375	33
34	.006304	.007	.0104	.01	.110	.00859375	34
35	.005614	.005	.0095	.0095	.108	.0078125	35
36	.005	.004	.0090	.009	.106	.00703125	36
37	.004453	—	—	.0085	.103	.006640625	37
38	.003965	—	—	.008	.101	.00625	38
39	.003531	—	—	.0075	.099	—	39
40	.003144	—	—	.007	.097	—	40

See note on next page.

Table of Decimal Equivalents of Stubs' Steel Wire Gauge

Letter	Size of Letter in Decimals	No. of Wire Gauge	Size of Number in Decimals	No. of Wire Gauge	Size of Number in Decimals	No. of Wire Gauge	Size of Number in Decimals
Z	.413	1	.227	28	.139	55	.050
Y	.404	2	.219	29	.134	56	.045
X	.397	3	.212	30	.127	57	.042
W	.386	4	.207	31	.120	58	.041
V	.377	5	.204	32	.115	59	.040
U	.368	6	.201	33	.112	60	.039
T	.358	7	.199	34	.110	61	.038
S	.348	8	.197	35	.108	62	.037
R	.339	9	.194	36	.106	63	.036
Q	.332	10	.191	37	.103	64	.035
P	.323	11	.188	38	.101	65	.033
O	.316	12	.185	39	.099	66	.032
N	.302	13	.182	40	.097	67	.031
M	.295	14	.180	41	.095	68	.030
L	.290	15	.178	42	.092	69	.029
K	.281	16	.175	43	.088	70	.027
J	.277	17	.172	44	.085	71	.026
I	.272	18	.168	45	.081	72	.024
H	.266	19	.164	46	.079	73	.023
G	.261	20	.161	47	.077	74	.022
F	.257	21	.157	48	.075	75	.020
E	.250	22	.155	49	.072	76	.018
D	.246	23	.153	50	.069	77	.016
C	.242	24	.151	51	.066	78	.015
B	.238	25	.148	52	.063	79	.014
A	.234	26	.146	53	.058	80	.013
		27	.143	54	.055		

Stubs' Gauges

In using the Gauges known as Stubs' Gauges, there should be constantly borne in mind the difference between the Stubs' Iron Wire Gauge and the Stubs' Steel Wire Gauge.

The Stubs' Iron Wire Gauge is the one commonly known as the English Standard Wire, or Birmingham Gauge, and designates the Stubs' *soft* wire sizes.

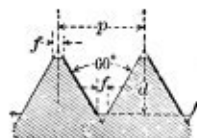
The Stubs' Steel Wire Gauge is the one that is used in measuring drawn steel wire or drill rods of Stubs' make, and is also used by many makers of American drill rods.



American Society of Mechanical Engineers' Standard

A. S. M. E. Standard for Machine Screws

United States Standard Form of Thread



Formula

$$\begin{cases} P = \text{pitch} = \frac{1}{\text{No. threads per inch}} \\ D = \text{depth} = P \times .64952 \\ F = \text{flat} = \frac{P}{8} \end{cases}$$

Standard Screws

Note—Maximum sizes given are the standard sizes.

Basic Size		Outside Diameter		Pitch Diameter		Root Diameter	
No.	O. D.—T. P. I.	Min.	Max.	Min.	Max.	Min.	Max.
0	.060-80	.0572	.0600	.0505	.0519	.0410	.0438
1	.073-72	.0700	.0730	.0625	.0640	.0520	.0550
2	.086-64	.0828	.0860	.0742	.0759	.0624	.0657
3	.099-56	.0955	.0990	.0857	.0874	.0721	.0758
4	.112-48	.1082	.1120	.0966	.0985	.0808	.0849
5	.125-44	.1210	.1250	.1082	.1102	.0910	.0955
6	.138-40	.1338	.1380	.1197	.1218	.1007	.1055
7	.151-36	.1466	.1510	.1308	.1330	.1097	.1149
8	.164-36	.1596	.1640	.1438	.1460	.1227	.1279
9	.177-32	.1723	.1770	.1544	.1567	.1307	.1364
10	.190-30	.1852	.1900	.1660	.1684	.1407	.1467
12	.216-28	.2111	.2160	.1903	.1928	.1633	.1696
14	.242-24	.2368	.2420	.2123	.2149	.1807	.1879
16	.268-22	.2626	.2680	.2358	.2385	.2013	.2090
18	.294-20	.2884	.2940	.2587	.2615	.2208	.2290
20	.320-20	.3144	.3200	.2847	.2875	.2468	.2550
22	.346-18	.3402	.3460	.3070	.3099	.2649	.2738
24	.372-16	.3660	.3720	.3284	.3314	.2810	.2908
26	.398-16	.3920	.3980	.3544	.3574	.3070	.3168
28	.424-14	.4178	.4240	.3745	.3776	.3204	.3312
30	.450-14	.4438	.4500	.4005	.4036	.3464	.3572



A. S. M. E. Standard

(Concluded)

Special Screws

Note—Maximum sizes given are the standard sizes.

Basic Size		Outside Diameter		Pitch Diameter		Root Diameter	
No.	O.D.-T.P.I.	Min.	Max.	Min.	Max.	Min.	Max.
1	.073-64	.0698	.0730	.0612	.0629	.0494	.0527
2	.086-56	.0825	.0860	.0727	.0744	.0591	.0628
3	.099-48	.0952	.0990	.0836	.0855	.0678	.0719
4	.112-40	.1078	.1120	.0937	.0958	.0747	.0795
	.112-36	.1076	.1120	.0918	.0940	.0707	.0759
5	.125-40	.1208	.1250	.1067	.1088	.0877	.0925
	.125-36	.1206	.1250	.1048	.1070	.0837	.0889
6	.138-36	.1336	.1380	.1178	.1200	.0967	.1019
	.138-32	.1333	.1380	.1154	.1177	.0917	.0974
7	.151-32	.1463	.1510	.1284	.1307	.1047	.1104
	.151-30	.1462	.1510	.1269	.1294	.1017	.1077
8	.164-32	.1593	.1640	.1414	.1437	.1177	.1234
	.164-30	.1592	.1640	.1399	.1423	.1147	.1207
9	.177-30	.1722	.1770	.1529	.1553	.1277	.1337
	.177-24	.1718	.1770	.1473	.1499	.1158	.1229
10	.190-32	.1853	.1900	.1674	.1697	.1437	.1494
	.190-24	.1848	.1900	.1603	.1629	.1287	.1359
12	.216-24	.2108	.2160	.1863	.1889	.1547	.1619
14	.242-20	.2364	.2420	.2067	.2095	.1688	.1770
16	.268-20	.2624	.2680	.2327	.2355	.1948	.2030
18	.294-18	.2882	.2940	.2550	.2579	.2129	.2218
20	.320-18	.3142	.3200	.2810	.2839	.2389	.2478
22	.346-16	.3400	.3460	.3024	.3054	.2550	.2648
24	.372-18	.3662	.3720	.3330	.3359	.2909	.2998
26	.398-14	.3918	.3980	.3485	.3516	.2944	.3052
28	.424-16	.4180	.4240	.3804	.3834	.3330	.3428
30	.450-16	.4440	.4500	.4064	.4094	.3590	.3688

The above standard for Machine Screws was adopted by the American Society of Mechanical Engineers at the Indianapolis meeting, May 28-31, 1907.

For full and complete details concerning this standard and the Engineers' recommendations, see their report, Volume 28, No. 9.



Tap Drills

For A. S. M. E. Standard Machine Screw Taps

The sizes given will cut considerably larger than the root of the thread, and are larger than published in some similar lists, but for practical operation, especially for machine tapping, will be found none too large.

Size of Tap	No. of Threads	Size of Drill	Size of Tap	No. of Threads	Size of Drill
0	80	55	10	24	23
1	64	53	10	30	20
1	72	52	10	32	20
2	56	49	12	24	16
2	64	48	12	28	14
3	48	45	14	20	9
3	56	44	14	24	6
4	36	43	16	20	2
4	40	42	16	22	1
4	48	41	18	18	C
5	36	39	18	20	D
5	40	38	20	18	H
5	44	37	20	20	I
6	32	34	22	16	L
6	36	33	22	18	M
6	40	32	24	16	O
7	32	$\frac{1}{8}$	26	14	Q
7	36	30	26	16	R
8	30	29	28	14	T
8	32	29	28	16	U
8	36	28	30	14	W
9	24	27	30	16	X
9	30	26			
9	32	25			



Tap Drills for Machine Screw Taps

Size of Tap	Size of Drill	Size of Tap	Size of Drill
1-56	53	11-28	18
1-60	53	11-30	17
1-64	53	12-20	17
1-72	52	12-24	16
1 1/2-56	51	12-32	12
2-48	50	13-20	13
2-56	49	13-22	12
2-64	48	13-24	11
3-40	47	14-18	10
3-48	45	14-20	9
3-56	44	14-24	6
4-32	44	15-18	5
4-36	43	15-20	4
4-40	42	15-24	3 1/2
4-48	41	16-16	3
5-32	40	16-18	2
5-36	38	16-20	2
5-40	37	18-16	B
6-30	36	18-18	C
6-32	34	18-20	D
6-36	33	20-16	G
6-40	31	20-18	H
7-30	31	22-16	L
7-32	1/8	22-18	M
8-30	29	24-14	1 5/8
8-32	29	24-16	O
8-36	27	24-18	P
9-30	26	26-14	Q
9-32	25	26-16	R
10-24	23	28-14	T
10-30	20	28-16	U
10-32	20	30-14	W
11-24	19	30-16	X

These drill sizes are larger than are published in many similar lists, but will be found none too large in practice.



Tap Drills

For V Thread Hand and Nut Taps

Size of Tap	Size of Drill	Size of Tap	Size of Drill	Size of Tap	Size of Drill
$\frac{1}{4}$ -18	12	$\frac{1}{2}$ -14	$\frac{13}{32}$	$\frac{15}{16}$ -9	$\frac{51}{64}$
$\frac{1}{4}$ -20	9	$\frac{7}{16}$ -12	$\frac{9}{16}$	1-8	$\frac{27}{32}$
$\frac{1}{4}$ -24	5	$\frac{3}{8}$ -10	$\frac{1}{2}$	$1\frac{1}{8}$ -7	$\frac{15}{16}$
$\frac{5}{16}$ -18	$\frac{1}{4}$	$\frac{3}{8}$ -11	$\frac{23}{64}$	$1\frac{1}{4}$ -7	$1\frac{1}{16}$
$\frac{5}{16}$ -20	F	$\frac{3}{8}$ -12	$\frac{23}{64}$	$1\frac{3}{8}$ -6	$1\frac{3}{4}$
$\frac{3}{8}$ -14	L	$\frac{11}{16}$ -11	$\frac{25}{32}$	$1\frac{1}{2}$ -6	$1\frac{11}{16}$
$\frac{3}{8}$ -16	N	$\frac{3}{4}$ -10	$\frac{3}{8}$	$1\frac{5}{8}$ -5	$1\frac{13}{16}$
$\frac{3}{8}$ -18	$\frac{5}{16}$	$\frac{1}{2}$ -12	$\frac{21}{32}$	$1\frac{3}{4}$ -5	$1\frac{15}{16}$
$\frac{7}{16}$ -14	S	$\frac{1}{2}$ -10	$\frac{11}{16}$	$1\frac{7}{8}$ -4 $\frac{1}{2}$	$1\frac{9}{16}$
$\frac{1}{2}$ -12	X	$\frac{7}{8}$ -9	$\frac{23}{32}$	2-4 $\frac{1}{2}$	$1\frac{11}{16}$
$\frac{1}{2}$ -13	Y				

For U. S. S. Thread Hand and Nut Taps

Size of Tap	Size of Drill	Size of Tap	Size of Drill	Size of Tap	Size of Drill
$\frac{1}{4}$ -20	9	$\frac{1}{4}$ -10	$\frac{21}{64}$	$1\frac{1}{4}$ -5	$1\frac{3}{8}$
$\frac{5}{16}$ -18	$\frac{1}{4}$	$\frac{7}{8}$ -9	$\frac{3}{8}$	$1\frac{3}{8}$ -5	$1\frac{11}{16}$
$\frac{3}{8}$ -16	$\frac{1}{4}$	1-8	$\frac{55}{64}$	2-4 $\frac{1}{2}$	$1\frac{1}{4}$
$\frac{7}{16}$ -14	$\frac{1}{4}$	$1\frac{1}{8}$ -7	$\frac{31}{32}$	$2\frac{1}{4}$ -4 $\frac{1}{2}$	$1\frac{5}{8}$
$\frac{1}{2}$ -13	$\frac{1}{4}$	$1\frac{1}{4}$ -7	$1\frac{5}{16}$	$2\frac{1}{2}$ -4	$2\frac{1}{8}$
$\frac{5}{8}$ -12	$\frac{1}{4}$	$1\frac{3}{8}$ -6	$1\frac{11}{16}$	$2\frac{3}{4}$ -4	$2\frac{3}{4}$
$\frac{3}{4}$ -11	$\frac{1}{4}$	$1\frac{1}{2}$ -6	$1\frac{13}{16}$	3-3 $\frac{1}{2}$	$2\frac{1}{2}$
$\frac{1}{2}$ -11	$\frac{1}{4}$	$1\frac{5}{8}$ -5 $\frac{1}{2}$	$1\frac{15}{16}$		

These sizes do not leave a full thread when holes are tapped, but are as near it as is desirable for practical manufacturing.



Tap Drills For U. S. Form Threads of Irregular Pitch

Size of Tap	Number of Threads to the Inch	Drill Size
$\frac{3}{16}$	24	28
	27	27
	30	25
$\frac{1}{4}$	24	7
	27	5
	28	4
$\frac{5}{16}$	20	$\frac{1}{4}$ inch
	24	$\frac{17}{64}$
	27	1
$\frac{3}{8}$	20	O
	24	$\frac{21}{64}$ inch
	27	Q
$\frac{7}{16}$	20	V
	27	X
$\frac{1}{2}$	12	Y
	20	$\frac{7}{16}$ inch
	27	$\frac{11}{16}$
$\frac{9}{16}$	18	$\frac{5}{8}$
	27	$\frac{23}{32}$
$\frac{5}{8}$	12	$\frac{17}{32}$
	18	$\frac{13}{16}$
	27	$\frac{11}{8}$
$\frac{11}{16}$	12	$\frac{19}{32}$
	16	$\frac{27}{64}$
$\frac{3}{4}$	12	$\frac{11}{16}$
	16	$\frac{21}{32}$
	27	$\frac{13}{16}$
$\frac{13}{16}$	12	$\frac{27}{64}$
$\frac{7}{8}$	12	$\frac{11}{8}$
	14	$\frac{23}{32}$
	27	$\frac{11}{4}$
$\frac{15}{16}$	12	$\frac{27}{16}$
1	12	$\frac{11}{4}$
	14	$\frac{27}{8}$
	27	$\frac{11}{2}$
$1\frac{1}{8}$	12	$\frac{11}{2}$
$1\frac{1}{4}$	12	$\frac{11}{2}$



Standard Dimensions of Wrought-Iron Welded Tubes

Briggs' Standard

Diameter of Tubes			Thickness of Metal, Inches	Screwed Ends	
Nominal Inside Inches	Actual Inside Inches	Actual Outside Inches		Number of Threads to Inch	Length of Perfect Thread, Inches
$\frac{1}{8}$	0.270	0.405	0.068	27	0.19
$\frac{1}{4}$	0.364	0.540	0.088	18	0.29
$\frac{3}{8}$	0.494	0.675	0.091	18	0.30
$\frac{1}{2}$	0.623	0.840	0.109	14	0.39
$\frac{3}{4}$	0.824	1.050	0.113	14	0.40
1	1.048	1.315	0.134	$11\frac{1}{2}$	0.51
$1\frac{1}{4}$	1.380	1.660	0.140	$11\frac{1}{2}$	0.54
$1\frac{1}{2}$	1.610	1.900	0.145	$11\frac{1}{2}$	0.55
2	2.067	2.375	0.154	$11\frac{1}{2}$	0.58
$2\frac{1}{2}$	2.468	2.875	0.204	8	0.89
3	3.067	3.500	0.217	8	0.95
$3\frac{1}{2}$	3.548	4.000	0.226	8	1.00
4	4.026	4.500	0.237	8	1.05
$4\frac{1}{2}$	4.508	5.000	0.246	8	1.10
5	5.045	5.563	0.259	8	1.16
6	6.065	6.625	0.280	8	1.26
7	7.023	7.625	0.301	8	1.36
8	7.982	8.625	0.322	8	1.46
*9	9.000	9.688	0.344	8	1.57
10	10.019	10.750	0.366	8	1.68

Taper of conical tube-ends, 1 in 32 to axis of tube ($\frac{3}{4}$ inch per foot).

The sizes of twist drills to be used in boring holes to be reamed with pipe reamer, and threaded with pipe tap, are as follows:

Size Tap	Diameter Drill	Size Tap	Diameter Drill
$\frac{1}{8}$ inch	$\frac{11}{32}$ inch	$1\frac{1}{4}$ inches	$1\frac{7}{16}$ inches
$\frac{1}{4}$ inch	$\frac{1}{4}$ inch	$1\frac{1}{2}$ inches	$1\frac{11}{16}$ inches
$\frac{3}{8}$ inch	$\frac{1}{4}$ inch	2 inches	$2\frac{1}{16}$ inches
$\frac{1}{2}$ inch	$\frac{3}{8}$ inch	$2\frac{1}{2}$ inches	$2\frac{3}{4}$ inches
$\frac{3}{4}$ inch	$\frac{5}{8}$ inch	3 inches	$3\frac{1}{4}$ inches
1 inch	$1\frac{1}{8}$ inches		

* By the action of the manufacturers of wrought-iron pipe and boiler tubes at a meeting held in New York, May 9, 1889, a change in size of actual outside diameter of 9-inch pipes was adopted, making the latter 9.625 instead of 9.688 inches, as given in the table of Briggs' Standard pipe diameters.



Machine and Wood Screw Gauge

Number of Screw Gauge	Size of Number in Decimals	Number of Screw Gauge	Size of Number in Decimals
000	.03152	25	.38684
00	.04468	26	.40000
0	.05784	27	.41316
1	.07100	28	.42632
2	.08416	29	.43948
3	.09732	30	.45264
4	.11048	31	.46580
5	.12364	32	.47896
6	.13680	33	.49212
7	.14996	34	.50528
8	.16312	35	.51844
9	.17628	36	.53160
10	.18944	37	.54476
11	.20260	38	.55792
12	.21576	39	.57108
13	.22892	40	.58424
14	.24208	41	.59740
15	.25524	42	.61056
16	.26840	43	.62372
17	.28156	44	.63688
18	.29472	45	.65004
19	.30788	46	.66320
20	.32104	47	.67636
21	.33420	48	.68952
22	.34736	49	.70268
23	.36052	50	.71584
24	.37368		

The difference between consecutive sizes is .01316 inch.



Decimal Equivalents of the Numbers of Twist Drill and Steel Wire Gauge

No.	Size of No. in Decimals	No.	Size of No. in Decimals	No.	Size of No. in Decimals	No.	Size of No. in Decimals
1	.2280	21	.1590	41	.0960	61	.0390
2	.2210	22	.1570	42	.0935	62	.0380
3	.2130	23	.1540	43	.0890	63	.0370
4	.2090	24	.1520	44	.0860	64	.0360
5	.2055	25	.1495	45	.0820	65	.0350
6	.2040	26	.1470	46	.0810	66	.0330
7	.2010	27	.1440	47	.0785	67	.0320
8	.1990	28	.1405	48	.0760	68	.0310
9	.1960	29	.1360	49	.0730	69	.02925
10	.1935	30	.1285	50	.0700	70	.0280
11	.1910	31	.1200	51	.0670	71	.0260
12	.1890	32	.1160	52	.0635	72	.0250
13	.1850	33	.1130	53	.0595	73	.0240
14	.1820	34	.1110	54	.0550	74	.0225
15	.1800	35	.1100	55	.0520	75	.0210
16	.1770	36	.1065	56	.0465	76	.0200
17	.1730	37	.1040	57	.0430	77	.0180
18	.1695	38	.1015	58	.0420	78	.0160
19	.1660	39	.0995	59	.0410	79	.0145
20	.1610	40	.0980	60	.0400	80	.0135

Letter Sizes

A	.234	H	.266	O	.316	U	.368
B	.238	I	.272	P	.323	V	.377
C	.242	J	.277	Q	.331	W	.386
D	.246	K	.281	R	.339	X	.397
E	.25	L	.29	S	.348	Y	.404
F	.257	M	.295	T	.358	Z	.413
G	.261	N	.302				



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